25

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Joel Bagnal, "Resolution of a Mandala," scent bottles, sterling, amber

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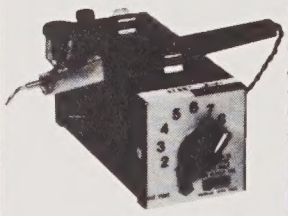

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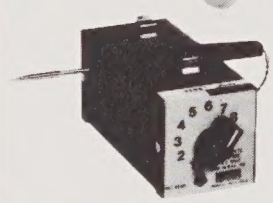

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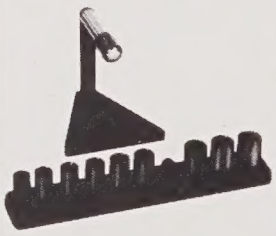

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REVIEWS

IMOGENE GIELING--JEWELRY
THE ELEMENTS GALLERY
766 MADISON AVE., N.Y., NY

Imogene Gieling, one of the first West Coast artists to direct her attention to creative jewelry, began her painting career as a student of Hans Hoffman. "I still see metallic surfaces with painterly possibilities" says this Texas native.

Indeed many of her works have the same kind of emotional content one feels in expressionist canvases. She has developed techniques enabling her to capture the effect of metal in its molten state. These deliberately eroded surfaces give the pieces the appearance of Bronze Age artifacts. Her dramatic neckpieces in this collection contrast rough textural gold or silver surfaces with semi-precious minerals.

One necklace combines stones, silver and gold with card-woven elements. The entire piece is reversible with red, yellow and black on one side, and blue, green, and violet combined with silver and malachite on the other.

"Recently," she says, "I have felt the need for a more specific kind of imagery. I am intrigued by the challenge of interpreting very powerful images in a miniature scale. To wear the moon, the sky and a star on a finger or to hold the spirit of an eagle on my breast... these are the challenges I have set for my most current work."

Imogene Gieling, "Torque," silver-gilt with Adriatic Amber

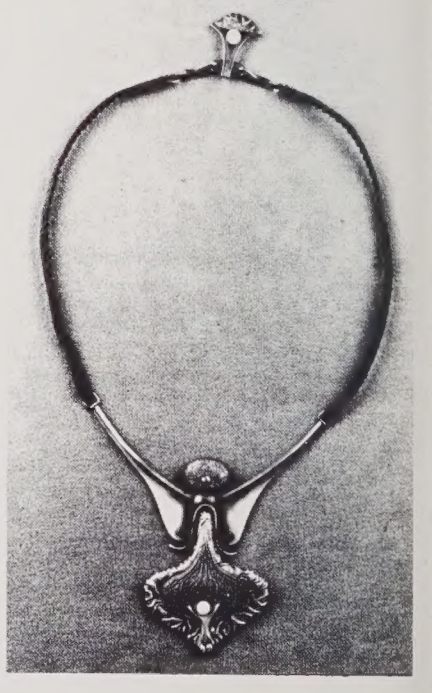
DESIGNING ARTIST'S SHOW--ANN GRUNDLER

by Shirley Shatzen

Ann Grundler had a show of 27 necklaces at Gallery Fair in Mendocino, CA, from March 17 to April 14. This work was her master-project for a Master of Art and was first exhibited at the art gallery of San Jose State University.

Those who attended the opening in Mendocino were surprised to find Ann Grundler had moved jewelry design into the 21st century. The titles of the pieces illustrate her concept to reflect the environment into her art work; themes and materials reflecting our technological advances are unified with the rhythms of nature. They have an aspect of personal intimacy, playfulness and humor.

I perceive that Ann Grundler will not long remain in the background of the jewelry designing field.



Ann Grundler, "Goddess," (neck-piece), sterling, pearls & sapphires, 1978

HUMBOLDT BAY AREA METALS INVITATIONAL

by Jaun Chrimoya

College of the Redwoods in Eureka, CA, was the host of the Humboldt Bay Area Metals Invitational in which 13 metalsmiths/jewelers were represented by 70 works.

This was a unique show in that it combined the craftsmanship and aesthetics of professional metalsmiths and jewelers who work in the academic world and those who work and sell in the community. This marriage of philosophical directions produced a show that was both alive with a deep conviction of craftsmanship coupled with a great diversity of material and technique. The show also served as a vehicle in which to enrich and educate the community to the diverse possibilities that can be obtained by each artist's personal interpretation.

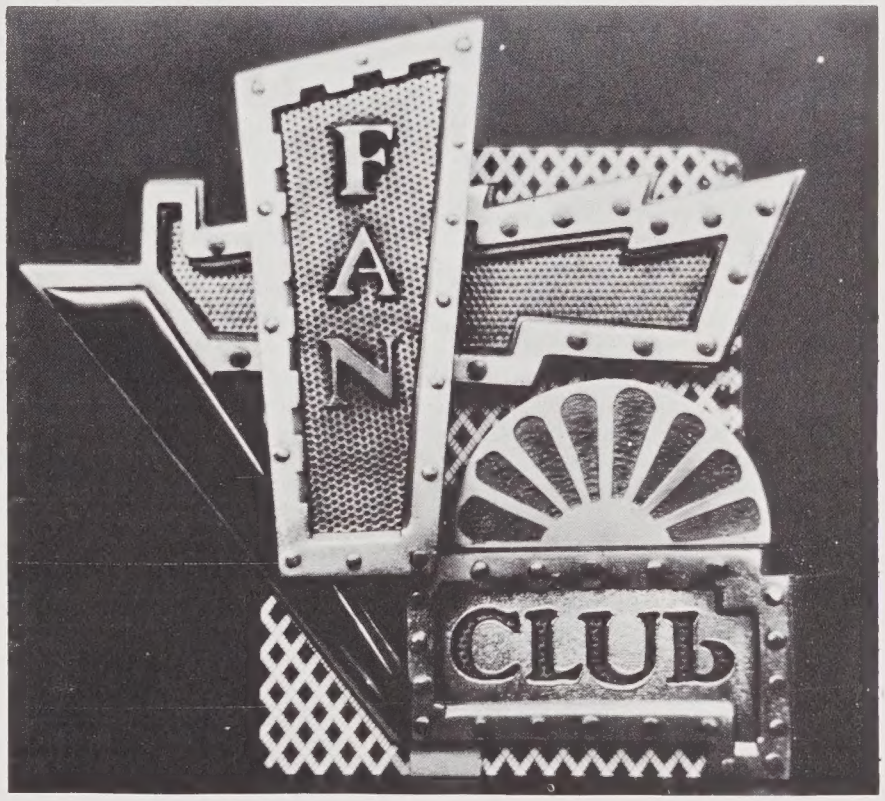
Although Humboldt County is a small community, no single artist's works predominated and an abundance of styles and desire for exploration and experimentation existed. The pieces ranged from functional jewelry to work that must be considered pure sculpture. Holly Sparkman's meditative and eclectic pieces avoid any form of functionalism and fall comfortably into this latter description. In her piece "Childhood," a facet plexiglass covering contains a small figure that seems to challenge and enrich our deepest assumptions about ourselves. A work of similar feeling is that of Jane Meyer's "Palm Held Pyramid," a life-size plexiglass shaped palm that reads as a diary, unfolding with symbols and visions of the Southwest. Paul Murphy's "Aldawan Hand Axe" of copper, steel, brass, bone, and polyester resin has the appearance of being an object of instrument of a scientific and technical nature unknown to civilization, defying all function.

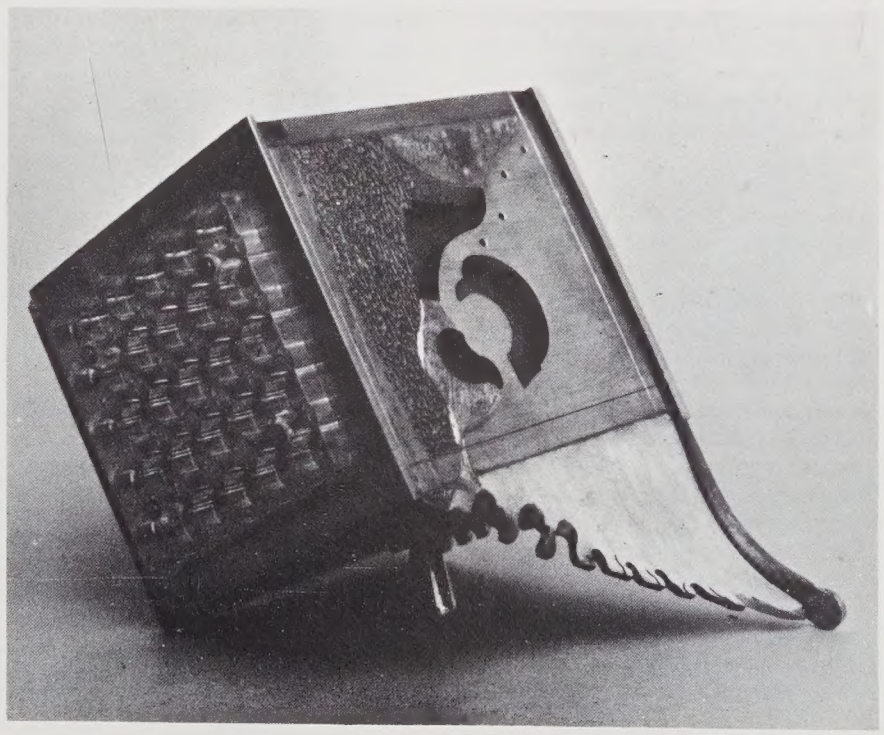
Another work of questionable function is John Rotter's container for 52 playing cards, "The Man I Want is the Gambling Man Who Wears The Long Gold Chain," made of brass, copper, nickel, steel, and lead. This piece, designed after a sign that graced the now demolished Fan Club, serves as a regional epitaph to the days when logging was king rather than as an actual container. Other pieces that take on the form of containers are David Laplantz's "A Block for Time-Dime Bank" with its highly crafted and elegantly tooled surface, and Jan Valvo's clear plexiglass and silver Gargoyle Container.

Objects that function as jewelry included Diana Penna's sculptured gold ring, set with a multi-faceted crystal, serving as a canopy for a somewhat hidden diamond. Teresita Villasenor's cast silver "Female Sea Serpent" was clutching a baroque pearl in its mouth, and Dennis Toth's various belt buckles were delicately executed in plexiglass, silver, copper, and brass. Gilbert Castro's "Comienzo" of brass and rosewood makes use of hand-worked wax cast faces and partial faces in conjunction with uncontrolled etched figures. Walter Kirkpatrick uses stones as images and anatomical components in his bracelets.

Works of a nostalgic impression are those of Jeff Georgantes whose "pins" of plexiglass, copper, silver, and seagrass used as a rope border surrounds a playful western landscape. Lynn Wegenka's "Corset" of plexiglass satin, silk, rosepetals, copper, and brass conjure up days of romanticism and lace handerchiefs.

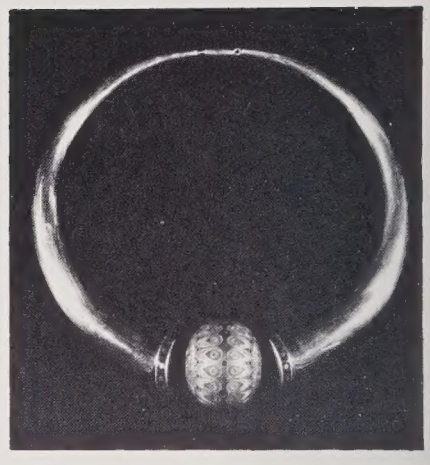
This regional representation of metalwork demonstrates the integrity for craftsmanship and the commitment to the field of metalsmithing and jewelry that exist amongst Humboldt County metalsmiths.





John Rotter, "The Man I Want is the Gambling Man Who Wears the Long Gold Chain," container; copper, brass, nickel, lead and steel, 6" high

David LaPlantz, "A Block for Time-Dime Bank," copper, brass & plexiglass, 2¾"



Michael Croft, "N.S. No. 3-H.S.S.F.," sterling, acrylic & enamel, 14 cm h. (photo courtesy of Tucson Museum of Art)

Michael Croft, "N.S. No. 2-T.T.C.O.," 14k gold, silver, enamel & pearls 7 cm h. (photo courtesy of Tucson Museum of Art)

ARIZONA CRAFTS '79

by Norman V. Lanquist

Arizona Crafts '79 (March 17-April 19) at the Tucson Museum of Art. Of note to metalworkers is that principal awards of this competition were given to jewelers. The juror's Best of Show Awards, sponsored by Arizona Designer Craftsmen, were presented to all three of Michael Croft's pieces of jewelry. Kurt Niece was given the George McCullough Memorial Award for one of his two selected bracelets.

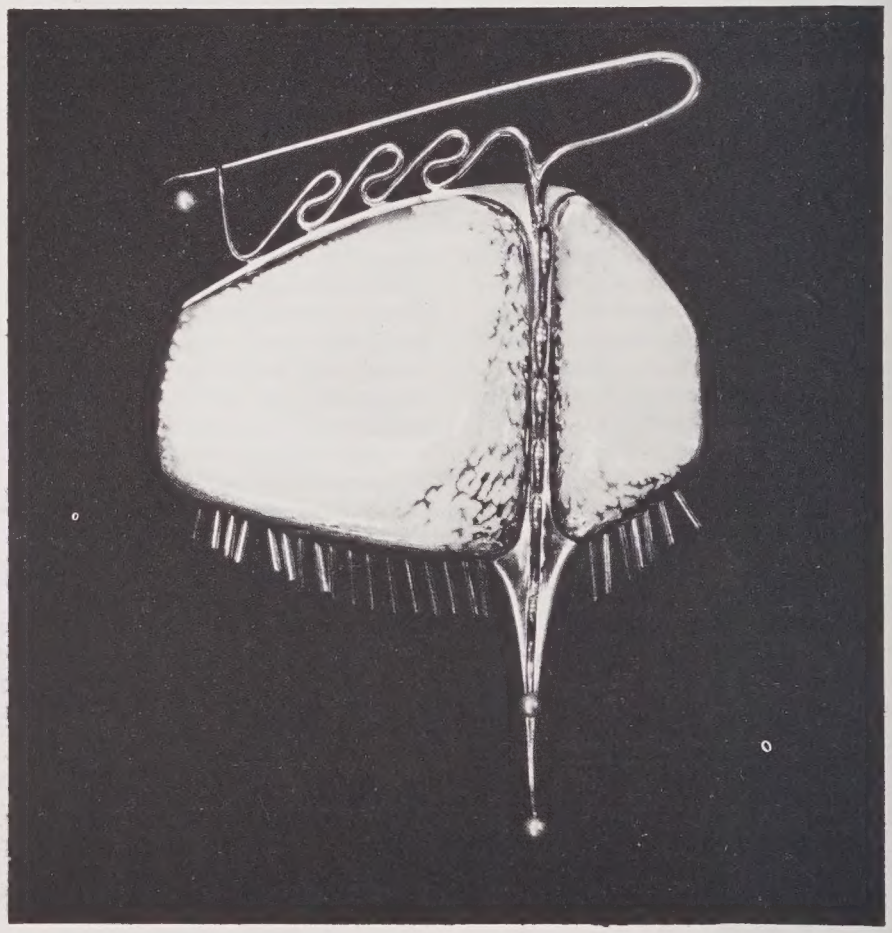
Croft's pieces were two neckpieces and a pin, *N.S. No. 1-A.P.R.O.*, *N.S. No. 2-T.T.C.O.*, and *N.S. No. 3-H.S.S.F.*, all demonstrating champleve or cloisonne enameling in combination with set stones. The opalescent translucency and the understated pearl accents contributed to the unity of the pin *N.S. No. 2-T.T.C.O. N.S. No. 1-A.P.R.O.*, a more ambitious neckpiece, offered a dimensionality enjoyable from several angles and a sumptuously satisfying unified chromatic richness achieved through transparent amber tones in the enameling and faceted citrine. Thoughts of John Paul Miller's enameled marine creatures and Paley's whiplash forging come to mind in contemplating this piece, although it is uniquely individual. Croft's understated choker, *N.S. No. 3-H.S.S.F.*, in acrylic, sterling and cloisonne, was compelling in its simplicity — the two halves of the tubular neckpiece terminated in front in an enameled sphere whose muted tones conveyed a feeling similar to mokume.

Croft, professor of jewelry at the University of Arizona, is a Tucson resident like the majority of exhibitors selected for the show. He is currently finishing a year's sabbatical (along with the development of a splendid beard), having received a Western States Arts Foundation, Visual Arts Fellowship Program, Honorable Mention. His activities were documented in "How Eight Craftsmakers Won the West and $5,000 and What They Did with Their Win," *(Crafts Horizons,* Dec. 1978), and in *Emphasis Monthly: Newsletter, Western States Arts Foundation* (Nov.-Dec. '78), which featured a photograph of his cast gold collar, "Tutankhamen Defiled," that had been part of the touring WESTAF/NEA Contemporary Crafts show which originated in Denver.

Kurt Niece, an enormously personable young man, began as a working silversmith on the Tucson scene and subsequently did some formal University of Arizona study. His award piece, *Serpentine Invader Bracelet,* featured a subtle image of a flying saucer intersecting the edge of a rugged planetoid. His other *Bracelet Form* seemed far more ambitious and complex in its delicate progression of varied colored bands which comprised a hollow bracelet accented by a bezel-set, rutilated quartz cabochon. Again, as in Croft's work, subtley, unity and understated muted effects were employed, rather than contrasts of brilliant colored stones or tortured metals.

Besides these award winners, other jewelers were well represented in the show. Betty Douglas, of Paradise Valley, relatively new to Arizona and a Kent State graduate, had two substantial, original and dramatic rings in married metals. Ruth Barker Johnston had a raised and cast *Jewish Spice Box* that suggested the sacredotal in its use of traditional emblems, the whole form being topped by a Shield of Solomon — or Star of David. Dana Coles' *Indy Pendant* at $765.38 (the 38 cents for the pun?), and the precise and irresistible kaleidoscope — presumably functional — by Dawn A. Nehls in varied metals were notable, along with Coles' enormously impressive jump rope in gold and silver. Relatively simple, but gosh, five feet of evenly-formed silver wire rope. . .?! One is nudged by the same spirit of breathtaking extravagance recalled by Croft's cloisonne marbles *Mibs for a Kinky Shooter* pictured in *Craft Horizons* (Dec. '78).

The cooly grotesque *Gothic Rocket* by George C. Judson, with its dragon wings and large faceted aquamarine, gained much of its charm from associations with the contemporary literature and illustration of heroic fantasy and science fiction. One is more likely to recall Franzetta and Moorcock than Chartres and St. Michel. Stunning in its dramatic simplicity and appealing both visually and



tactilely is Bonnie Gwaltney's *Zoomorphic Knife* in bronze and metal. The highly polished bronze handle looks made for the hand (as if the piece were actually functional) and the blade is convincing in its effectiveness for both slicing and dicing. It's likewise beautiful in the formal unity of the cool colors and sweeping forms of handle and blade. Associationally, the piece is enjoyable in its evocations of Art Deco sculpture, classic car hood ornaments, and those wickedly alluring and delightfully awful 1950's ceramic black panther T.V. lamps and planters.

A single-minded concentration on the qualities of the metal itself was evident in Kate Wagle's *Neckpiece (To Be Worn Between Shoulder Blades)* — a sizable pendant in pierced and repousse satinfinished sterling. This piece, more than others displayed, was conceived with the wearer in mind with its dramatic element of theatrical surprise: a modest little choker when approaching the viewer, a showy piece of organic pseudo-armor when departing.

Oddly enough, this piece is probably the most misleadingly illustrated in the catalogue. The depth and sinuous taper of the neckpiece, nicely suggestive of mid-sixties high-rise 'apehanger' chopper handlebars is totally lost in inky blackness. Similarly, *Jewish Spice Box* appears to rest on a thin cylinder, rather than a tapered base due to loss of detail in a too-dark illustration. Croft's *N.S. No. 3-H.S.S.F.* emerges insufficiently from the overmysterious obscurity of the page. Most of the pottery comes off better, but rather than fault the doubtless careful efforts of the photographer — it's easy to image how splendid his 8x10 glossies must look — it's difficult not to believe the printers' gremlins were not hard at their usual efforts at sabotage of perfectly good copy.

One aspect of the catalogue, however, is perfectly clear; that's the stinging challenge issued in it to Arizona's craftsmen by Eudorah Moore, the juror:

"Opportunity for talent to surface has long been a personal concern. Opportunity for the public to have access to the highest qualitative expression of crafts art (in which I include functional as well as non-functional works) is my personal concern as well as one of the stated aims of the National Endowment for the Arts. Open juried exhibitions professionally presented and supported with a catalog are one of the logical vehicles for achieving these ends.

"Yet I must confess a suspicion that neither of these concerns has been fully answered in the materials submitted to this exhibition. Did most of the young emerging Arizona craftspeople utilize this opportunity to become known? Have the majority of the State's leading craftspeople created pieces of unusual significance or impact for the show, and did the majority of them enter? Are Arizona's craftspeople denying the public the opportunity to become familiar with the highest manifestations of the craft arts? Is the day of the open juried exhibition past? These are questions I asked myself as I juried this exhibition — questions which seemed important enough to share with you.

"There are of course stunning exceptions and the award winners are among them: pieces where superb craftsmanship is coupled with extraordinary design unity and concept, pieces where one senses that exploration of the expressive possibility of materials culminates in a work whose impact transcends the medium to make its own impressive statement, and pieces which somehow represent the energy, excitement breadth of expression and idea which is the contemporary crafts movement. For those I am grateful. I yearn to see more!"

Goll-ly, Arizonians, can we take it? At any rate we have a year to brood and stew over it in our respective shops, though good conception, hard work, and energetic participation — if we take Ms. Moore at her word — would be more in order.

THE ELEMENTS: TRANSFORMATION BY FIRE

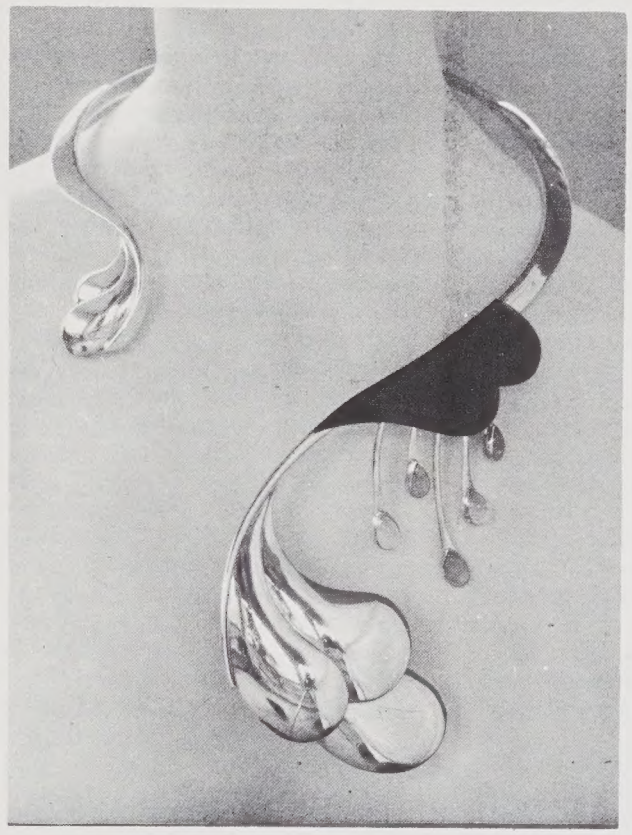
by Betty Longhi and Ron Wyancko
Greater Reston Arts Center,
February 3-March 11

Fire was the common tool of the artists exhibiting in "The Elements: Transformation by Fire." This exhibit of metal, clay and glass was small but showed work of excellent quality. Included were works by six metalsmiths, ranging from jewelry to large architectural sculptures. Jeweler Ron Wyancko's two pins dealt primarily with surface treatments and shape. In one, the undulating lines of reticulated silver were repeated in rosewood and spiculum tentacles. A second pin of inlaid acrylic, chased silver and pearls achieved an interesting sense of balance by the visual weight of the acrylic form placed above the smaller silver shapes. In contrast, the linear quality of a forged form created between the anvil and the hammer was evident in the jewelry made by Betty Longhi. Her "Necklace with Geode" emphasized an agate perched in a pocket of fused silver. A semi-circle of forged silver flowed around the stone without touching it and extended over the shoulder. Wrought iron was well represented in work by Peter O'Shaughnessy and Nol Putnam. Most interesting were a small sculpture by Peter which had a lovely sense of space and movement and a wonderful whimsical "Dragon Door Knocker" by Nol. This creature from mythology with his forked tongue and twisted snake-like body was strong and functional, yet light and happy.

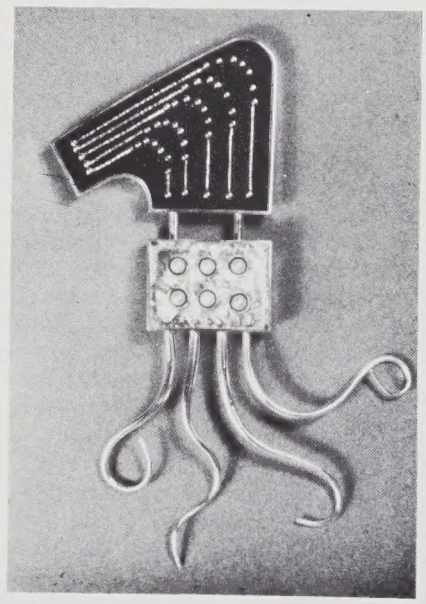
A massive floor sculpture "Geo Set", by Eric Von Laidlaw, consisted of large bronze forms cast and welded reminiscent of rock masses.

Douglas Quinn's sculpture, "Three Figures," in cast brass and wood was a striking statement of simplicity within a complex world. Heavily patinaed and textured brass raised to eye level by highly finished pillars of wood, gave an impression of pinnacles in a coral reef.

Conceptually, the Reston group had an exciting approach; however, the exhibit could have been strengthened by the inclusion of additonal quality artists and a more colorful display. The potential of the "Fire" theme was not used to its full advantage.



Betty Helen Longhi, "Little Black Cloud That Cried," silver, ebony, moonstones & aquamarines



Ron Wyancko, pin, silver, pearls and acrylic

Peter O'Shaughnessy, paper holder, wrought iron

STATEMENTS IN METAL: FROM GOLD TO IRON

by Ludwig Stein

Crafts is an umbrella term that embodies a difference in attitude between functional and non-functional objects. Based on this disparity, the work of certain disciplines becomes inaccessible to the category of fine arts. This is as if to say that acceptance to an exclusive system requires non-functional attitudes.

While crafts has always been a word that defined specific disciplines such as metalsmithing, weaving, and ceramics, perhaps the time has come to establish a new meaning for the word crafts. It is difficult to find an explanation for the considerable differences in attitudes that affect contemporary art.

As Robert Pinkus-Witten points out, there is "firstmanship." That is not to say that something is new, for if something were to be really new, no one would be able to recognize it. That is not to say that art progresses; for art does indeed not progress. It changes.

"Firstmanship" is Pollock and De-Kooning, and those things that have come after, all of the field paintings, are nothing more than the bathing of the eye, they are CRAFT. Art needs firstmanship. It also needs to go beyong function. It needs to go beyond entertainment, and needs to go beyond politics. For ancient man, the act of making art was a means of understanding the universe and capturing it in some way so that he could manage it and use it when necessary. This is the first form of functional art. This is also innovation. In each new exhibition that one encounters, there should be that challenge of newness, of deliberateness that gives a work a special kind of exhilaration and authority.

It was with these thoughts in mind that I first approached the exhibition of Marilyn Davidson and Michael Jerry at the Everson Museum. Both are sculptors, metalsmiths, and "craftsmen" of extraordinary talent whose reputations have grown steadily since they began showing in the New York area in the mid-sixties.

I found it around the corner in a room called The Decorative Arts Gallery. To me, that was a stroke of bad luck. I had thought the word "decorative" arts in connection with this work was a contradiction in terms. However, there was a real joy in discovering imposing forms in metal, sculpture and jewelry hung together in a beautifully designed intimate space. One could wander through the space and back out into the large open gallery again. At that point, I was reminded of the way the minimalist and post-minimalist ethic in sculpture is presented in most museums. This sculpture has always been given massive amounts of air to breathe, as if in its very minimal attitude, one had to face a challenge. One should not be distracted by anything else around it. This show should have been in that kind of space; pieces in a large, open gallery surrounded by lots of air allowing them to breathe, to come to life. This leads us to a discussion of the work and the creative process. How does each piece achieve its final individual nature? What kind of internal and external gestation nourishes its birth?

The work itself has, at times, a botanical nature. The human body itself is used as a form around which sculpture can be created, and it seems to relish the graceful fall line of the human figure.

In the work of Marilyn Davidson, symbolism and metamorphosis are present in varying degrees in all of the pieces. They reach a high degree of significance in certain neck pieces. In number 35, the brace that supports the necklace is the contour line which follows and then leaves the body unexpectedly. A stone rests in the very center, holding the eye for a brief moment, and then the necklace is back into the dance again. It is an elegant display of the use of line. The strength of this piece is how the line affects the contour of the body and further how the contour of the body must affect the necklace.

Several other works by Marilyn Davidson in the show continue the investigation of metamorphosis. In *Podbrooch* and *Podbrooch with detachable element*, one looks from exterior to interior, and there finds great value in discovery of inner shapes. Here also is the attitude of protection and, at the same time, exposure. This concept of "shell" as a protective organism in the brooch is "firstmanship." In its own simplicity, it forces one to look inside and find that this is where the precious objects lie. The piece has the ability to close up preciousness and keep it hidden away to use when necessary.

Moving down the cases to the geometric brooches, a wide range of intellectual activity occurs on the surface. Arithmetic principles are brought into display — isometric projections of a stone — and suddenly on one, the focus of the eye, from the point of view of the stone looking out. A unique reversal of perception.

In the exhibitions, Marilyn has also included a series of rings. Here the symbolism comes into greater play than anywhere else. The rings range from simple raised elegance to a piece that becomes Elizabethan in its presentation. There is here also *The Dragon and Monkey Ring*. The dragon sits contemplating the monkey, and vice versa, and in that moment exists both tension and rest. I found most of these rings to be extremely sensitive to the shape of the hand and, again, the contour of the body. Also in the exhibition is a piece called *Torque*, a quiet, strong, cleanly designed neckpiece with enormous authority. This body sculpture carries with it the capacity of ownership. By that I mean the necklace and not the person wearing it. However, while looking at a functional object called *Copper vessel*, that point of Davidson's work is driven home. It's not about material. This work is about specific color on an intimate scale; color used more uniquely than I have seen it to this point with any of these materials. It takes the expected color of the material and transforms it into something new, more subtle and more intimate than before.

Michael Jerry's work is different. It contains attitudes and sensibilities that have to do with growth. The use of metals comes to him as naturally as does his skill as a draftsman. His subtle sensitive handling of the materials from silver to iron produces forms that have a fullness and rightness and strength about them. It is at the same time bold and sensitive.

In piece number two, one sees an Egyptian sensibility — clean, regal, elegant, with consideration for the human figure which it enhances. One moves through the range of Jerry's work and suddenly comes to *Neck piece and Brooch in Box*. We have here poetic ambiguity, which is a factor of major importance in this piece. The piece made for, and intended to be worn by someone, becomes a sculpture resting on its own pedestal. Next to this is a case of functional objects — frying pans, pots using iron, pewter, and copper— and we are reminded of his consumate skill in the more traditional techniques of metal working.

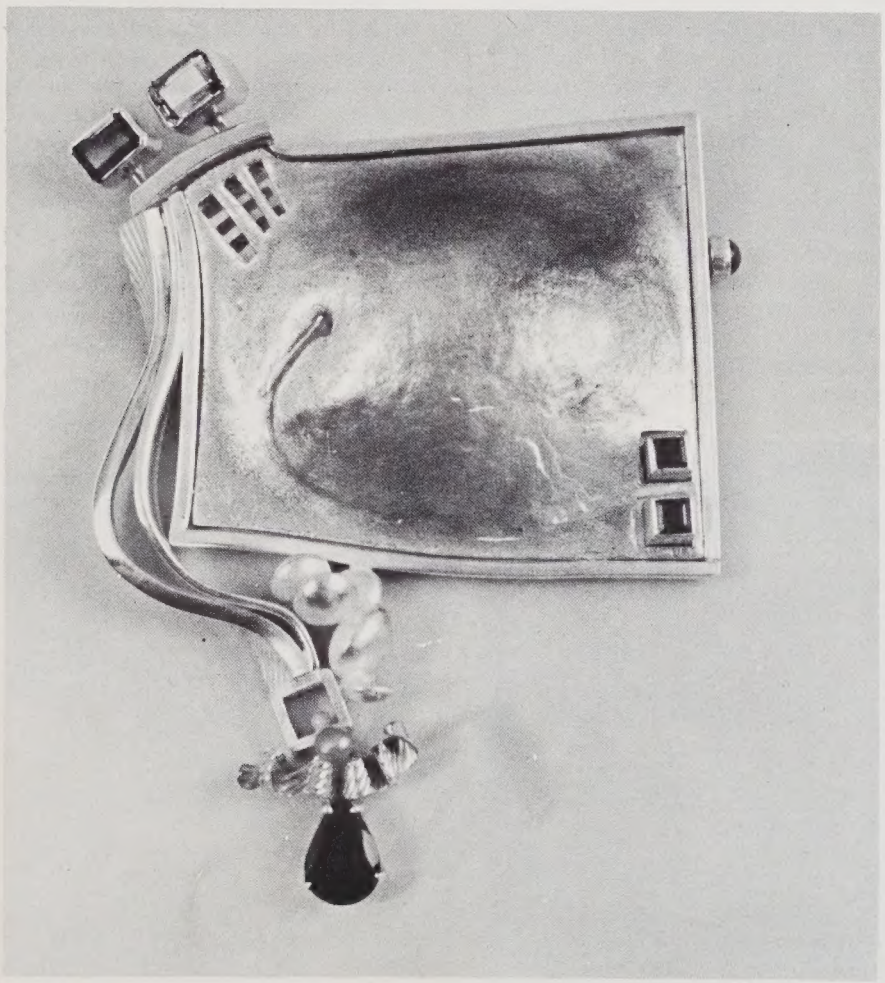
When one comes out of the small gallery space they are confronted by the iron pieces and the blacksmithing processes that Jerry has brought to higher art. They have built in them the same romantic notion and re-discovery of art deco and art nouveau. A classic case is the *Music stand and Candle holder*. A piece called *Wall Sculpture* moves away from function toward linear form creating a line in space. Another metal piece with iron and cement that is simply called *Linear Forms* parallels that direction. What we are looking at now is sculpture, not craft.

Finally, Jerry's tour de force is that piece in which he has made the transition and gone from artisan to artist, metalworker to sculptor. *Platework Number One* is the end of the relationship with the decorative, with the nouveau. It is as if those pursuits have finally been exhausted and the raw strength of the metal is left; an absolute, perfect, elegant structural form.

Both Davidson and Jerry have presented us here with new approaches to metals as well as attributive attitudes and concepts that have fresh surprises. This exhibition is about "Firstmanship." This is not craft.

Michael Jerry, goblet, pewter, 7" h.

Marilyn Davidson, enameled brooch, silver, gold, rubies, citrine & garnet, 3½" h.



CERTIFICATE OF MASTERY: BOSTON UNIVERSITY PROGRAM IN ARTISANRY : Paula S. Dinneen

by Tim McCreight

Paula's symmetrical groupings of domes, spheres, and trapezoids provide a workable frame within which her mixed metals and textural photo-etching are used to advantage. The resulting jewelry, though sometimes large, retains a preciousness and personal scale that keeps it from becoming unwearable. The work showed a sensitivity to mechanics, incorporating both rotating elements that allowed for reversible pendants and sophisticated clasps.

The metalwork was well displayed in cases built for the occasion and designed around the specific pieces being shown. The presentation was augmented with a wall-mounted display of jewelry sketches and biographical material. The Certificate of Mastery show is designed to collect and examine the result of three years of study. In Paula's case it does that and points to an exciting future too.

A couple hundred years ago the advancement from journeyman to the status of master was achieved only after the creation of a master piece and the approval of the ruling tribunal of the regional guild. This tradition is alive and well at the Boston University Program in Artisanry where the culmination of three years of intensive study is a show and a document called the Certificate of Mastery.

One of this year's candidates for the certificate was Paula S. Dinneen whose 'coming out' show was held at the Boston Architectural Center from June 6 to the 15th. On exhibit were 11 pins, pendants, and earrings displaying a consistently delicate style and demanding standard of craftsmanship.

Paula Dinneen, "Photo-Etched Neckpiece," sterling

BALTIMORE WINTER MARKET SPONSORED BY AMERICAN CRAFT ENTERPRISES, A SUBSIDIARY OF THE AMERICAN CRAFTS COUNCIL, February 21-25, 1979

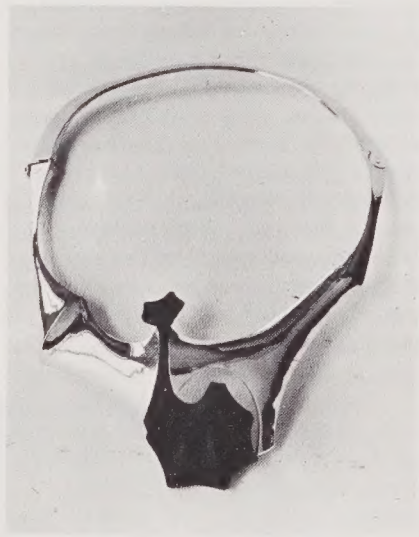
by Sybil Robins

Arriving amidst a record 22" snowstorm that paralyzed the city, 324 determined craftspeople juried from over 1100 entries from states east of the Mississippi, plus 25 exhibitors from last August's Pacific States Crafts Fair, pulled themselves together in time to present the third annual Winter Market of American Crafts at the Baltimore Civic Center. More than 75 metalsmiths exhibited, in the categories of enamels, holloware, knives, forged iron, jewelry and sculptural metals.

Memorable exhibitors in metals included Robert Davis with an elegant, cohesive display of precisely wrought contemporary silver jewelry shown against chamois-colored cloth backgrounds. Outstanding was a series of angular, fabricated sterling bracelets of hollow box construction set with highly oxidized pyrite crystals that glowed with an irridescent greenish cast.

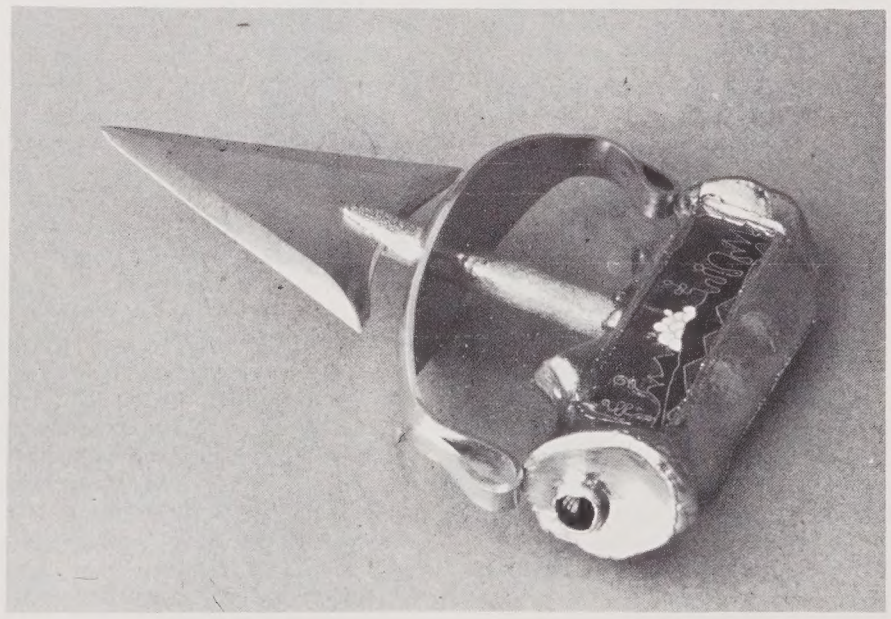
Metalsmiths Michael and Maureen Banner showed a range of production jewelry and holloware, set off by a series of one-of-a-kind hollow-formed and forged sculptural neckpieces. The finest of the group (pictured) incorporates a rich, hand-carved rosewood insert whose warmth contrasts against the cool polished silver.

Outstanding for its creativity was a display by Don Johnson which featured fantasy perfume bottles of electroformed copper with gold wash, topped by colorful cloisonne stoppers and embellished with abalone, onyx, rosewood, garnet, baroque pearl, etc. In addition, Johnson showed a series of imaginative knives, also profusely embellished with enameled inserts, inlays and stones.



Michael Banner, collar, sterling, rosewood

Don Johnson, "Poker Player's Knife," copper, enamel, onyx, brass, 6" l



INVITATIONAL 1979 THE CRAFTSMAN'S GALLERY SCARSDALE, NY

by Sybil Robins

"INVITATIONAL 1979" at The Craftsman's Gallery, Scarsdale, New York, March 31 - April 28, 1979, featured the work of 20 outstanding craft artists in all media.

Metalwork included six pieces from Pahaka's on-going series of sterling "Flying Pins," typified by symmetrical flat pierced wing-like projections from which are hung an imaginative variety of polished and textured silver elements and bezel-set stones and minerals. One striking example in the group combines angelskin coral with small lapis beads and soft gray Phillipine pearl, with touches of gold.

An exciting array of masterful cloisonne work by Colette highlighted the metalwork in the show. A five-inch high pyramid sculpture on a thick lucite base set the theme of Colette's display. The main body of the pyramid, comprised of four large sections of cloisonne on copper, suggests a volcano that had "blown its top," with the "broken" pieces strewn on the lucite base. The sides are filled with Colette's personal imagery, intricately wrought in rich cloisonne colors . . . a lady riding a panther amidst a group of panthers; a herd of elephants; a stylized human hand whose fingers are covered in a mosaic of eggs, mushrooms, red lips, blue chevrons and droplets of blood, their mysterious symbolism known only to their maker.

The simplified "hands" reappear as basic shapes for two magnificent pendants whose surfaces are covered with pyramids, flying birds, lips, eggs, mushrooms and other symbols in rich tones of violets, browns and greens in transparent enamels, the effect made even richer looking with the use of 24K gold bezel and cloisonne wire, gold-filled chains and an amethyst set outside the basic outline of the hand form.

The piece-de-resistance in Colette's flamboyant collection in the exhibit is a truly magnificent massive winged cuff bracelet whose central round cloisonne section depicts a bird rising from a crenelated rooftop, in soft blues, grays and mauves, while two side cloisonne elements in the form of huge feathery wings eche the color of an opal, all set in gold.

Many of Ellen Dimsdale's jewelry designs in the show are characterized by unexpected combinations of materials, like vinyl with gold, as well as admirable design restraint. Besides being a visual treat, the juxtaposition of materials offers an exercise for the mind as the viewer tries to comprehend what is before him. A pale gray vinyl rectangle fits snugly over an unseen frame, topped by gold and a baroque pearl that suggests a human form. Deep green vinyl against gold has surprising richness.

Even when working with more commonly used material combinations, Dimsdale's pieces achieve a seemingly effortless purity and elegance that surely is the result of much thought and care.

Colette, "The Chicken Knows," neckpiece, enamel, 18k & 24k gold, lapis, 3½" l

BROOKFIELD 25, JUNE 14-SEPTEMBER 11

by Anne Besse-Shepherd

This year marks the 25th anniversary of the Brookfield Craft Center, in Brookfield, Connecticut. In order to commemorate this occasion the Craft Center is hosting an exhibition, partially funded by the National Endowments for the Arts. The show consists of work by artists — craftsmen who have instructed at the center. After twenty-five years, the list of former instructors contains over 300 of the most respected names in the crafts field. A jury selected 90 to be invited of whom 69 responded by sending pieces to the show.

The metal in the exhibit is excellent and represents the high caliber of instruction that the center has long been known for. Among the metalsmiths represented are:

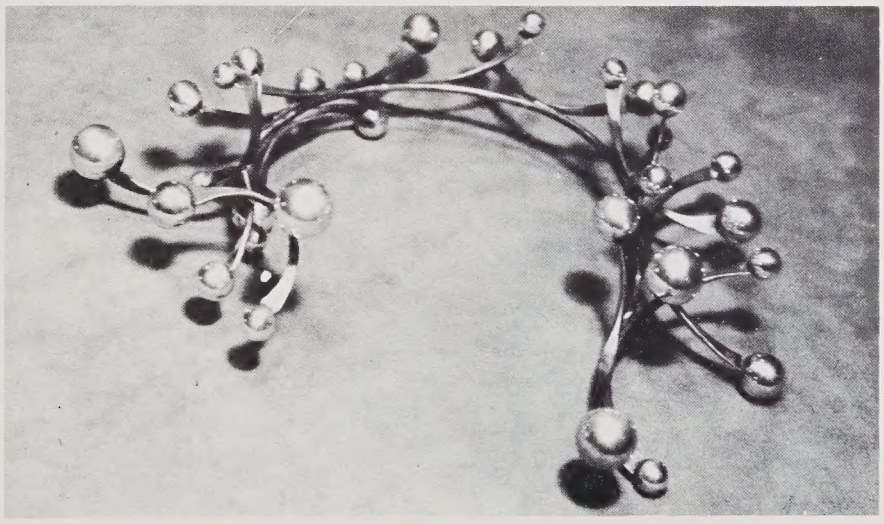
Joel Bagnal
James Bennett
Sharon Church
Richard Coble
Susan Corey
George Van Duinwyk
Robert Ebendorf
John Fix
Pat Flynn
Jem Freyaldenhoven
Harold Helwig
Mary Lee Hu
Barry Merritt
C. James Meyer
Elliot Pujol
Mary Ann Scherr
Art Smith
J. Fred Woel

Jem Freyaldenhoven's "Krasnaya," a wall piece, juxtaposes beautifully chased-repousseed and constructed metal against a strong red acrylic plane. Sharon Church's "Hand Object No. 5" of sterling silver and 14k gold is a series of planes exploring light and shadow. The lack of surface decoration makes the piece crisp, clean, and strong. Pat Flynn's "Bag Form" of copper, sterling silver, and 14k gold is one piece in a series of his exploration of the subtleties of the bag form.

The two enamelists represented are James Bennett with his "Pattern Brooch" and Harold Helwig's "Couple." The two pieces are quite different — Bennett's brooch uses dramatic opaques while Helwig's wall piece demonstrates the remarkable translucent, almost liquid, quality he achieves with his lead-free enamels.

Harvey Jeacock, the new director at Brookfield, organized the show, displayed the work beautifully, and designed its elegant and unique catalogue. Mr. Jeacock is concentrating on developing a more comprehensive metalsmithing program at the craft center which will be hosting many Fall workshops along with the regular classes.

Editor's Note: See Section under Workshops

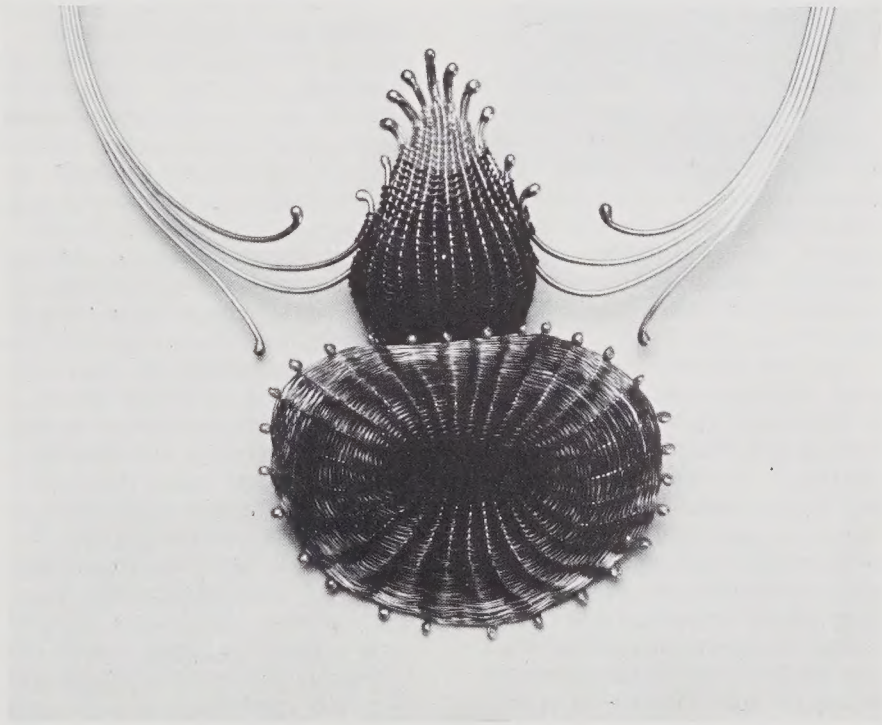


Below left: Mary Ann Scherr, necklace, sterling, shells

Bottom left: Art Smith, choker, sterling

Below right: Jem Freyaldenhoven, "Krasnaya", wall piece, acrylic, 14k gold, sterling, pearl, synthetic stones

Bottom right: Mary Lee Hu, choker No. 35, fine and sterling silver, 24k gold, lacquered copper, aluminum electrical wires



NELSIE DAVIS "METALS, GOLD & STERLING"

by Susan Long

"Metals, Gold & Sterling," an exhibition by Nelsie Davis, of White Salmon, WA, was presented by the Contemporary Crafts Gallery in Portland, OR early this year. The show included 11 pieces of jewelry and four drawings.

Davis has been focusing on metals for the past four years. By constructing her jewelry from flat metal sheets rather than casting each piece, she creates items which have a substantial, almost sculptural quality. The viewer is moved to touch and weigh, not merely to observe, the lustrous necklaces and pins. Hollow fabrication permits Davis to reveal the beautiful subtlety of the flat gold.

Two major pieces, "Puzzle" and "Knot" demonstrate how well she succeeds. Both necklaces also show the artist's interest in studying the movement of line around the neck toward a front focal point.

The 14k gold "Knot" necklace is influenced by primitive images of spirals and targets. The knot is seven separately constructed hollow forms soldered together. The eye traces the inward and outward curves with curiosity, almost automatically — as one does a Mobius strip. The effect is enhanced by the smooth surfaces of the gold reflecting and shadowing each other.

The drawing of this necklace, which was included in the exhibit, increases the viewer's appreciation by revealing the evolution of this design from the rounded shapes of a knotted rope to the characteristically squared-off edges seen in the final product. The use of flat pieces of metal and hollow construction result in a work of art rather than simply a copy of a pleasing shape.

The 14k "Puzzle" is named because of its maze-like center focal point which is a solid circle with a circle within, sliced down the center and hinged. One traces the curves and lines as they seem to divide and flow. The six curved pieces which form the neckband itself are uniquely joined in what carpenters call a half-lap joint which here is articulated by a tiny pin. The careful engineering permits the necklace to fit well and comfortably around the neck. "Puzzle" is an important piece in the collection and is a stunning example of this artist's skill and talent.

Nelsie Davis, necklace, 14k gold

The double-image pins and brooch grow from Davis' interest in insects. She is a beekeeper and fly fisherman, who ties her own flies, in addition to being a jeweler. The "Butterfly" conveys the feeling of arrested motion by the long curve of the wings and by the shading created by the depth of the design.

The sterling necklaces have a more complex design motif. The shapes are in general more intricate and seem influenced by less controlled patterns, although the balance is carefully maintained and the craftsmanship is always at a high level. In some the center focal point has become quite large or diverse — that is, split into several components rather than a single drop as seen in the two gold necklaces.

Nelsie Davis has a degree in sculpture from the Boston University School of Fine and Applied Arts. Her jewelry has the kind of solid and tactile quality that one associates with that larger art. She has very successfully adapted that feeling to the scale of this craft. The pieces are skillfully designed to be functional and long lasting, as well as beautiful. The combinations of materials, attention to craftsmanship, and — above all — her designs, have lifted them beyond function and ornamentation into the area of artistic creation.

"BARRY MERRITT . . . . . SOLO" GALLERY OF CONTEMPORARY ARTS, ROCHESTER, NY

by Nina Gaby

In his newest body of work, a show entitled "Barry Merritt . . . . . Solo," Merritt has sought to explore and visually document the concept of tension. Tension, as Merritt is defining it in this group of bracelets, brooches and earrings, is achieved through various techniques and materials in each of the four series which comprise the show.

The first series, that of "stretched skin" involves very thin layers of hammered gold and silver which have been fused together in the mokume technique. These thin sheets have been wrapped to silver frames with 18 karat gold wire and fused to produce a lustrious, oxidized surface closely resembling old skin. The results are very oriental in effect, and Merritt readily cites Japanese packaging techniques as his original inspiration for these pieces. The tension in this series stems from this feeling of containment, of one element being wrapped tautly over another to hold it in place.

The tension of the frames themselves led Merritt to the next series, his "fishing pole" series. By using only the skeletons of the stretched skin pieces he is able to investigate a far more linear aspect of tension. In these pieces fine wires have been stretched and pulled to define the negative space which they contain. The clasps on these brooches become part of their visual line and the wrapping becomes more extreme and is far more integral to the design than merely an outgrowth of function. The juxtaposition of subtle stones, such as heart of ivory and blue pearl add a color balance which almost detracts from the inherent feeling of linear tension that the forms themselves create.

Merritt's most personal pieces form the next group, a "swing series" in which Merritt wants to combine the simplicity of a swing with the tension of a tree branch. He has added small shells enclosed in small 18 karat gold buckets, or swings, to these intricate pieces in a sort of self symbolism which seems forced. The tension in these pieces is less a natural flow and more a contrived visual message.

The last series in the show deals with surface tension and is more akin to work Merritt has done in the past. One brooch is actually the first piece started and the last to be finished. Tension is achieved in these pieces by working on the outsides of the forms, by adding coins, stones, metal braiding, fusing, scratching, all superficial and more traditional directions rather than achieving the sense of tension built into the construction. One of the most popular pieces in the show, a handsome bracelet in heavy hollow constructed sterling, is from this series. The surface of the metal is scratched to give the feeling of an electric field, situated against an imbedded whale's tooth with an intense linear pattern of its own. The piece is further intensified by an intricate clasp formed from a Chinese double pearl, coral and jade.

Merritt himself is most excited with the fishing pole series. "This is the direction I want to pursue because of the positive and negative forces. I want to stop equating the idea that 'more is better' in terms of the amount invested in material."

Concept is becoming a greater issue to Merritt. His first thoughts about the new series began in November but germinated until work began in February with a few gesture line sketches. He seems to be growing less concerned with materials, showy technique and hidden construction, and is perhaps becoming more comfortable with implementing the most simplistic means to define a concept.

(Nina Gaby, a Rochester Institute of Technology graduate, is a potter working in porcelain. She is also art critic for the New Women's Times.)

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JEWELRY BY WOMEN:
FOREE-JOHNSON METAL SMITHS
CHAPEL HILL, NC

by Richard Davidson

Foree—Johnson Metalsmiths of Chapel Hill, North Carolina, recently presented their first major exhibition, Jewelry by Women (April 14 through May 15). The invited participants were Janice Matowitz, Peggy Johnson, Betsy King, and Julie Shaw. Also on display were works by the shop's continuing exhibitors: Carol Mitchell, Janet Harriman, and Lynn McNees.

Of the invited artisans, Janice Matowitz (now Janice Coco) exhibited the strongest exploration of abstract composition. Her silver containers, rings, and pendants were primarily concerned with clean, elegant lines, refined surfaces, and the crisp relationship of sculptural forms. One silver ring was particularly effective in its use of a small field of short tube sections clustered and oxidized to create an illusion of greater depth. Folded wire mesh was employed as an interesting textural element in one of her pendants, while another pendant was unique in relation to her other displayed work in its use of feathers and a photograph.

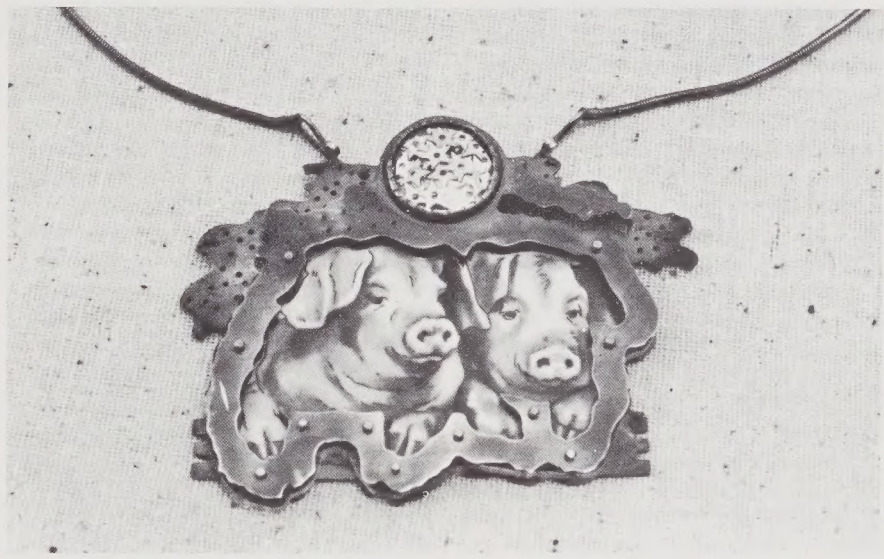
The works of Peggy Johnson were in almost the reverse proportion of representational to abstract design. Her filled, un-stoned cloisonne necklaces employed unusually attractive subdued color schemes, while a bracelet of linked modular construction utilized fused and textured sheet and bezel-set cabochons. Stamped on the back of this bracelet was a personal reflection, reading almost like a found poem. The rest of her pieces were less abstract. There were a number of her enameled badge/pins ("Cupcake," "Eggplant," "Jersey's Finest-Tomatoes"), the lettuce necklace with each of its links stamped with a varietal name, and a very handsome cuff bracelet — "Zebra danio" — designed as a tropical fish encircling the wrist.

Betsy King's work was almost entirely representational, with words or imagistic forms created by one or more layers of fine pierced work. Although she displayed a functional range of works from stick pins to pendants, her most adventuresome and wittiest pieces were the picture frames. The multiple layers of pierced sheet tended to be organized by formal or thematic aspects of the framed images. The enclosed photos were of people from generations ago, conventionally attired and set in studied postures of repose — in contrast to the hard, sharp, much more "active" metalwork. Along with the visibly past time, the flair of the metalwork further insulated the photos' subjects from us, and made their serenity all the more ironic in a contemporary setting.

Julie Shaw's work bore some similarities to Betsy King's, relying heavily on piercing as the central technique. In addition, though, she used holes and indentations as a surface texture. She, too, included photos of earlier times, but they were more declarative in pose — a sailor hugging his sweetheart, a stern couple with the gent resolutely grasping his lapels. In addition to the photos, Ms. Shaw also included other fragments of our ephemeral culture: bits of postcards, cut-out cartoons, little foil stick-em stars. One brooch brought the stars, pierced work, and a cartoon of two pigs together in a humorous combination of disparate elements.

Carol Mitchell, one of the shop's continuing exhibitors, displayed a variety of pieces: earrings, pendants, pins and brooches. Her designs were abstract, clean and simple, and all highly wearable. Her pin/brooches for holding real or silk flowers utilized lengths of tubing with various end treatments. The tops were sawed a short distance and the tube walls peeled back, suggesting that the growth force itself burst through the metal.

Janet Harriman's works were primarily small, functional pieces — combs, pendants, pins, etc. Most of them employed etching and/or hand engraving, some displaying an excellent sense of color in multi-metal pieces. Of all the exhibitors in this women's show, Ms. Harriman's was the only work which utilized images of women as a major design subject. Some pieces portrayed women in turn-of-the-century finery; others used the profiles of women as a design motif. The profiles were simplified or grouped in such a manner as to give a first impression of being an abstract line. One puzzled over the odd familiarity of this line until it suddenly revealed its source.



Julie Shaw, "Pig Pendant," silver, brass, cartoon, foil stars

Betsy King, "By the Sea," silver, brass, acrylic, photo, sea shells

Lynn McNees displayed her highly idiosyncratic rings and pin/pendants of silver and gold (some with bezel-set irregular cabochons). Her clarity of style was due in large part to the use of punches of her own design and manufacture; and her ubiquitous use of coherent bands of silver wires, their ends fused and splayed out, as both decorative and structural. Many of her pieces were composed of, and some their form determined by, scrap. It was somehow encouraging to see the detritus of the trade turned into such charming work at the last moment — a sort of last-chance reprieve from the melting pot.

All things considered, the show was remarkable. The consistently high quality of design and manufacture displayed by all the exhibitors would be noteworthy in itself, but that a show of this caliber could be assembled by two partners in a new shop in a small town is extraordinary.

WORKSHOP REVIEW

ANODIZATION WORKSHOP WITH JAMES WARD

by Jeanne Keefer

A three-day workshop in the electro-chemical anodization of the refractory metals titanium, tantalum and niobium (columbium) was held at San Diego State University from April 28 to May 1. In one of a series of workshops he will be conducting in the U. S., James Ward, from London, spread what he termed "the titanium word" among a group of twenty eager jewelers. Participants included SDSU graduate students, invited local jewelers and SNAG members Arline Fisch, Helen Shirk, Marcia Lewis and Mona Trunkfield.

Ward provided great amounts of technical information, much of it unpublished in recent articles on the subject. (See: Titanium: Metal of Many Colors, Craft Horizons, August, 1977; The Coloration of Refractory Metals, Goldsmiths Journal, 1979, etc.) A number of technical considerations which were either briefly mentioned or not included in the articles were examined during the workshop and found to be valuable information for the understanding of the process and its potential.

First, and most importantly, Ward demonstrated that the surface finish of the metal to be anodized is critical. Any variation in the surface: sand blasting, engraving, grinding, emery finishes or polishing gives a different result at any one voltage. The phenomena of light striking an oxide layer of a specific thickness is the cause of the apparent color, and surface changes profoundly modulate the effect. An extensive palate of subtle and dramatic color variations becomes available when this surface factor is understood and exploited.

Secondly, Ward discussed the working characteristics of refractory metals other than the most familiar, titanium. Tantalum and niobium (columbium) are relatively unknown in this country outside of certain medical and industrial uses. Ward has outlined their commercial applications as well as their specific attributes in his paper, The Coloring and Working of the Refractory Metals Titanium, Niobium and Tantalum for Jewellery and Applied Applications published by the Worshipful Company of Goldsmiths Technical Advisory Committee in London.

Both tantalum and niobium are considerably more expensive than titanium, but have certain advantages in workability and coloring capacity. In contrast to most alloys of titanium, which are hard and brittle, with little movement possible beyond simple bends, tantalum and niobium are marvelously workable. Workshop participants successfully tried chasing and repousse, roller printing and forging. According to Ward, either metal (tantalum being slightly easier) can be raised from a disc to a cylinder without annealing. Work hardening seems to occur only to a certain point, and then remains constant, due to an apparent ability of the metal to rearrange its internal stresses. The inherent tensile strength of either metal permits the working of very thin areas without creating an overly fragile structure. Additionally, Ward claims that chemically pure tantalum can be TIG welded, while the others must depend on cold connections.

The process of coloring any of the three metals is identical, but each will yield a different apparent color at the same voltage. Ward showed exciting examples of using two or three different metals together, such as a titanium frame held together with tantalum rivets. Anodization occurred after assembly, but their specific responses resulted in one color for the frame and another for the rivets at the same immersion voltage. Of the three metals, tantalum proved to be the most brilliant and irridescent, giving wonderful peacock colors.

Finally, it was demonstrated that quite different effects can occur depending on whether the current supply is AC or DC. Ward uses exclusively DC, which will yield a much more even and intense coloration in the immersion process. In the "painting" process, AC or DC results are similar to each other; some variation occurs in the color but not in the evenness.

James Ward spreading "The Titanium Word."

Ward constantly reinforced the absolute necessity for caution when using a voltage regulator. If not properly grounded, or incorrectly used, fatal shocks can result. The process of anodization is exciting, and relatively simple, so long as safety considerations are respected.

The SDSU workshop was scheduled to last for three days. However, the response was such that Jim stayed on for several more days, coming to the studio for more advanced work with individual graduate students, and enjoying the San Diego climate. Inspired and enterprising students introduced him to some of the more casual recreational aspects of Southern California life, notably "The Beer Run," a night across the border in Tiajuana, and an off-road trip to the desert to see the cactus blooming. In all, it was an exciting and successful educational experience for everyone.

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BOOK REVIEWS

METALWORKING FOR JEWELRY TOOLS, MATERIALS, TECHNIQUES—VON NOSTRAND-REINHOLD, 1979; $ 15.95, HARDBACK
by Tim McCreight

Reviewed by Marcia Lewis

Tim McCreight is a self-taught jeweler. He has a B. A. degree in sculpture and an MFA from Bowling Green State in Ohio. He operates a one-person jewelry-production business that deals with some forty shops and galleries along the east coast.

About the book:
It seems an insurmountable task — writing a book geared to the beginner which offers us something unique. When I first heard this book was in the making, I was skeptical as to its chance for success. We have had copious numbers of books in the last decade devoted to this subject. But this book does have several unique features and they are worth mentioning.

This is an easy-to-read book. I can see it will end up grubby with finger prints from much thumbing through by students looking for answers to their questions. The first chapter tells us clearly and simply what all the different metals are composed of. Everything you ever wanted to know about the components of metal, but were too lazy to look up in less easy-to-read books of this nature.

The color plates are terrific. Very clear, very bright and readable. The illustrations are also very handsomely presented. The one criticism I have has to do with being able to interpret the illustrations. It isn't easy to match up the illustration with the part in the text which explains what's going on. There is ample space below on the page - here a description would have been welcomed.

Altogether, this will be a valuable book to have on hand.

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GOLDSCHMIEDEKUNST
by Reinhold Reiling

Reviewed by Klaus Kallenberger

Goldschmiedekunst by Reinhold Reiling; works by 32 European goldsmiths; Publisher: Hans Schoner, Konigsbach/Pforzheim, Germany; cost to SNAG members $33.70 plus $4 postage; order from Hannelore Gabriel, 1469 Rosena Ave., N. Madison, OH, 44057.

Goldschmiedekunst is bound in brown cardboard and measures 9" x 10". It has 45 color plates and good quality reproductions. Titles, materials and dimensions are given with each work. The book is an anthology of goldsmiths with a few examples by each. In all, the book represents 32 craftspersons from seven European countries. Other than a brief introduction, there is no text.

Reinhold Reiling states that the goldsmiths represented are his friends, friends who he feels contribute significantly to the present state of jewelry in Europe. There is a strong cohesion of attitude, approach and style in the works featured. Many of the goldsmiths also have drawings, renderings of their ideas, or works illustrated which show a connection to the past only in the tradition of the craft and the excellence of worksmanship. His images and ideas are very much a matter of the present. In fact, they, with the other works illustrated, signify an avant gard. Definite crossovers from the jewelry "thing" as a wearable jewel, to the graphic statement, to the almost sculptural, are evident. The imprimatur of a strongly defined personal style is obvious in each person's work. The tendency toward the geometric and the subtle are richly manifested with multicolored golds and various patinas on silver or other metals, mokume, enamels, as well as steel. Some of these goldsmiths enter sculpture through the area of object making.

This book would be a significant resource to the goldsmith who wants to keep abreast of current European jewelry developments. The illustrations stimulate and inspire. The selection of craftspeople is adroit. The work is masterful.

Some of the featured artists are: Reiling, Bury, von Skal, Martinazzi, Boettinger, Lorenzen, Rothman.

100 JAHRESCHMUCK DESIGN SCHMUCK
by Walter Lochmueller

Reviewed by Klaus Kallenberger

100 Jahre Schmuck Design Schmuck—Ideen im Wandel eines Jahrhunderts, by Walter Lochmueller (100 Years of Jewelry Design, Jewelry Ideas Through the Changes of One Century 'in Germany')
publisher: Hans Schoener, Koenigsbach/Pforzheim, Germany; cost to SNAG members $50.05 plus $4 postage; order from: Hannelore Gabriel, 1469 Rosena Ave., N. Madison, OH, 44057.

This book is bound in bright yellow cloth and measures 9"x10". It is very richly illustrated with full color plates, mostly renderings for designs of jewelry. Some actual pieces are side by side with these renderings, demonstrating the accuracy of the book is a brief commentary on the various changes of style. The book is illustrated in similar layout to the commentary. Works from the 1880's to 1972 are shown. The introduction is printed on pale yellow stock with easy to read bold type. The illustrations are printed on ceramic coated paper.

Designs chosen for this book reflect the commercial orientation of the goldsmith's art in Germany. This is especially evident as one approaches the work of the 1960's. A cascade of Neobaroque works are cleverly changed into the biomorphic assymmetries of the Art Nouveau style, to be changed again into the hard and antiseptic geometry of the European version of Art Deco. A brief reference is made to the work produced during World War II, emerging into the bland, sinuous styles of the post-war years. More energy is absorbed by the forms and designs of the 1960's. Yet, to the art jeweler and the fine crafts person this work shows a contrived and restrained attitude which is punctuated with the often lavish and pointless use of diamonds. The obviously elegant works are comprised by lack of character and signature.

This book would be of great value to the teacher of jewelry or the decorative arts. To the practicing goldsmith it might be a source for detail and style references. Naturally, the jewelry pictures are German in flavor and might not hold significance to American designers other than curiosity and design stimulus.

Some of the people featured are: E. Beck, H. Ott, E. Betz, W. Schueler, A. Schempf, H. Ochs, K. Bohnenberger, S. Landwehr, and R. Elsaesser.

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JAMES MALENDA
"METAL AND ENAMEL FORMS"
at the Spring Street Enamels Gallery
May 5-June 10, 1979

by Antonia Schwed

The metal and enamel forms of James Malenda were recently shown at the Spring Street Enamels Gallery, 171 Spring St., Soho, NY. It was a beautiful and impressive exhibit. The gallery area given over to Malenda's work had the atmosphere of a small, elegant museum, and the cases, the fixtures and the lighting were just right for his art.

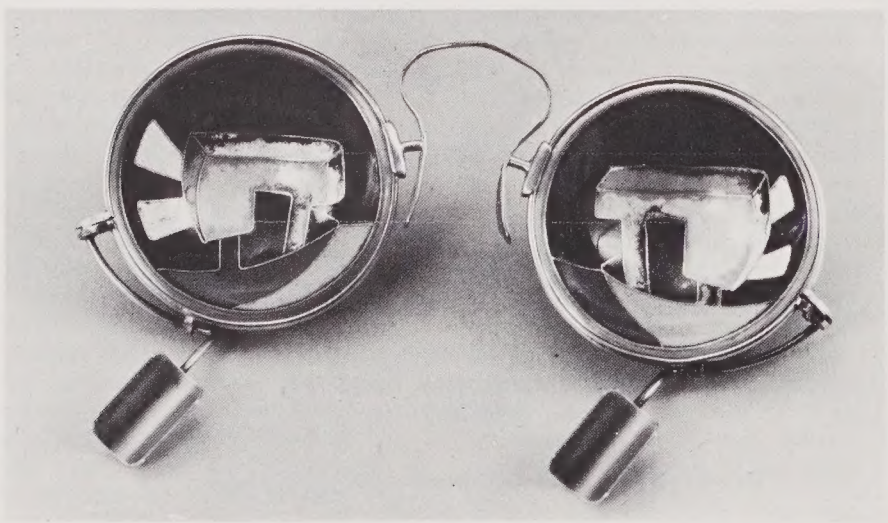
Malenda's work is a mixture of enameling and metalsmithing. Enamel is used in his structures and fantasies in ways that display much of the true potential of enamel. People tend, I think, to confuse this difficult, exciting medium with the way in which it is too often used. Suppose, for instance, that oil paints were looked upon scornfully just because there have been hosts of mediocre, muddy, and unoriginal pictures made. Well, it is equally mistaken to assume, because enamel can be used to cover ashtrays, that the ashtray indicates the total range of enamel possibilities. In this show, enamels come into their own.

There is an interesting range in Malenda's work — from the sculptural metal form, using only a small amount of enamel, to forms where enamel dominates, and pieces range from several inches to two feet or so. The largest forms are his "passion cup" forms (the "Passion Cup," says Malenda, "is a cup which has no base and cannot be placed down until its contents are completely drunk") and most are richly decorated with enamels.

One stunning sculpture consists of a beautiful pair of spurs, each decorated with an enameled, photo-etched picture and each set along one side with a small cabochon coral stone, a ruby and a sapphire. Then there is a handsome ivory chalice, all handcrafted of silver and ivory tusk with enamel on the base. And perhaps my favorite was a marvelous plique-a-jour silver egg cup, with the feet and legs of a chicken and two tiny beady eyes hidden among the brilliant enamels. I also enjoyed "Sinai Sonata" — a miniature sculpture-picture, complete with tiny camel and the opulent desert colors of blazing sun and exotic tent. In one case were displayed Malenda's delightful and skillful "spectacle pins" (or pendants, if you choose). These are enameled disks set into antique spectacle frames, incorporating transparents and opaques, foils and cloisons to make eyeglass frames chock full of wild color and design.

A splendid large picture is called "Glass Madame." It is a lady, a mirror and an overall complex design, done in six etched copper tiles. It is rich with cloison designs set into the etched recessed areas and the coloring is a perfect mixture of opaques and transparents. Malenda's artistic blending of transparent and opaque enamels in one harmonious piece exhibits the finest kind of enameling skill.

Overall, a splendid show.



James Malenda, "Spectacle Ashtray," gold, silver, enamel, 4½" w

INFORMATION

FIRST CRAFT AUCTION BENEFITS HAYSTACK

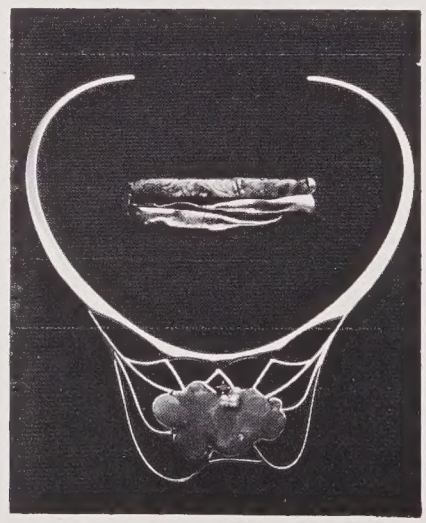
Eighty-eight works of art in craft media were sold for a total of $36,775 at the first major craft auction to be held in New York City. The highest bid of $3000 went for a 14k gold necklace with prehnite, pearl cluster and ruby by Ronald Hayes Pearson. A burnished blackware pot by Maria and Julian Martinez was sold for $2500.

Over 100 collectors and buyers attended the auction last Thursday evening, April 26, at the Jack Lenor Larsen Showroom on East 59th St. Other winning bids included $800 for Diane Itter's "A Small Knotted Study," $400 for a 9"x5" ceramic "Sounding Closed Form" by Toshiko Takaezu, $700 for "Bells and Wire for Haystack" by Mary Walker Phillips, $725 for a pin by Robert Ebendorf and $1200 for a blown glass vase by James Carpenter.

The works of art were donated by past and present faculty members of the Haystack Mountain School of Crafts in Deer Isle, ME, which benefits from the proceeds of the auction.

Ronald Pearson, necklace, 14k yellow gold, prehnite, pearl cluster & ruby

Miye Matsukata, pin, jade, 18 & 24k gold (photo by David Arky)



Haystack, one of the leading art schools in the country, offers summer courses in all craft media to students and professionals from the U.S. and abroad. Included in the auction were outstanding examples of hand-blown glass, gold and silver jewelry, ceramics, graphics and textiles. Other leading American craftsmen represented were metalsmiths Arline M. Fisch, Heikki Seppa and Eleanor Moty.

The $41,000 realized from the auction and ticket sales will be used for the construction of Gateway, a new building designed by architect Edward Larrabee Barnes for the Haystack cam pus. The building will serve as an entrance to the school and will provide additional facilities for students and the public. A gallery and forum in the building will be named in honor of Francis Merritt, director of Haystack for 27 years. Adjoining the Gateway building will be the Mary B. Bishop Amphitheatre and Memorial Woodland, honoring the school's founder. Joan Mondale is Honorary Chairman of the Gateway project; Jack Lenor Larsen is Chairman.

Orland Larson, goldsmith from Mahone Bay, NS, and president of the national craft organization, the Canadian Crafts Council, accompanied the Chinese Crafts Delegation as their official escort when they crossed Canada visiting craftsmen, craft schools, and craft businesses during the month of May. Included in the delegation from the People's Republic of China were: Mrs. Kanj Li, Mrs. You Lin, Mr. Ren Liu-Pei, and Mr. Feng Chen-Shu. They visited seven of ten provinces from Victoria, British Columbia to Lunenberg County in Nova Scotia. This tour was organized by the Canadian Crafts Council under the sponsorship of the Department of External Affairs as part of the official cultural exchange programme between Canada & the People's Republic of China. It was a reciprocal visit to one which was made there in 1977 by four Canadians which included Mr. Larson as head of the Canadian delegation.

CRANBROOK ART ACADEMY's THOMAS TEACHES THE PROS

The Academy of Art's metalsmithing department is just 31 years old, yet it was the first in this country to grant a fine arts degree in the medium.

As forerunners, Academy metalsmiths have had to experiment continually, sometimes developing new processes and techniques or creating unique tools as by-products of their work.

No one is more aware of this than Richard Thomas, department head since 1948 and author of the book *Metalsmithing for the Artist-Craftsman.*

In addition to documenting his own experiments, Thomas has built a collection of his students' theses. Together they contain a wealth of original information — enough, in fact, to attract the attention of the technical director of Goldsmiths Hall in London, England.

(Formally called the Worshipful Company of Goldsmiths, this organization has been in existence for about 800 years. All gold and silver articles made in England must be hallmarked, or certified, to prove that the items' contents conform to legal standards of fineness or purity. There is no comparable organization in the U.S.)

Goldsmiths was so impressed with Thomas' work that they invited him to England for an extended visit and study. Granted a sabbatical by the Academy partially funded by the National Endowment for the Arts, Thomas accepted the invitation and is spending the present semester in London.

Part of this time is being spent developing six monographs that will be chapters of his next book. The abstracts will deal with Thomas' experimentation complemented by his students' work, much of which is more advanced than anything ever seen by Goldsmith technicians.

Topics covered in the monographs include the prevention of fire-scale formation on sterling by non-toxic chemical preparation; the conversion of two-dimensional drawings into three-dimensional castings with an intermediate commercial photo-engraving process; and a noncomforming die system.

HOME FURNISHINGS FEATURED AT INTERNATIONAL CRAFT SHOW

Integrating crafts with home furnishings creating a meaningful living environment was the motif of the "Seventh International Craft Show" highlighted by three room settings coordinated by Bill Goldsmith, partner of LCS, Inc., of New York City. Bill Goldsmith, a craftsman himself, has long been known as a designer who lends support and offers encouragement to craftsmen who show excellence in design and workmanship. For several years, he has commissioned the work of individuals from around the country, providing them with a showplace for their work. An active participant in the design and craft community, Bill Goldsmith took the opportunity at the Seventh International Craft Show to bring to light his concept of incorporating fine crafts and handcrafted objects in conjunction with sophisticated and elegant limited production furnishings into the home environment. For the purpose of expressing his concept in home furnishings, Bill invited Robert Hart, Jody Locker and James Potucek, three prominent New York designers to assist him in creating three room settings at the Coliseum.

This innovative feature of the Seventh International Craft Show generated interest among designers, architects, craftspeople and collectors as well as buyers from museums, galleries, shops and department stores. It offered an impressive and stimulating visual experience as well as the opportunity to appreciate the versatility of crafts and the myriad possibilities for their use.

FILMS AND SLIDES

Doug Steakley has eight slide kits of the Contemporary English Jewelers Exhibition for sale. He is willing to sell them at a 15% discount which brings the price from $55 down to $46.75. His address: Sixth and Mission, P. O. Box 301, Carmel, CA 93921.

PUBLICATIONS

"The Crafts Business Encyclopedia" by Michael Scott has been published in a soft cover edition by Harcourt Brace Jovanoirch at $3.95. This new edition contains the most important current information on marketing techniques and money management for craftspeople. Since the hard cover edition was published two years ago, "The Crafts Business Encyclopedia" has been widely acclaimed as "the best of the batch of craft business books." Michael Scott is the Editor of The Crafts Report. Schools and organizations which use the book as a text in workshops, seminars, and classes are entitled to a 10% discount on quantities of 1000 more, or a 15% discount on 2500 more copies. "The Crafts Business Encyclopedia" can be ordered by mail from: Book Department, The Crafts Report, 700 Orange St., P. O. Box 1992, Wilmington, DE 19899.

Prices: Hard cover - $10 + 50 cents postage; Soft - $3.95 + 45 cents postage; Quantity prices Soft - $3.55 + 25 cents postage per copy for 1000 more $3.35 plus 20 cents postage per copy for 25 or more copies.

Crafts Directory/Europe is now available in a completely revised edition. The Directory is an invaluable source book of reference for travelers whose prime interest is in crafts. It covers 25 countries, is arranged alphabetically, and consists of a brief introduction to each country. Price: $12.00 includes postage and handling. Write to: WCC, 22 W. 55th Street, NY, NY 10019.

A visual handbook by Dennis deJonghe on the inlay technique niello is now available. The 35-page handbook compiles historical information, recipes and 90 slides depicting niello procedures. The cost is $50 plus $3 postage and handling. Write Dennis deJonghe, 380 Woodward Ave., Buffalo, NY 14214.

AMERICAN "SHEFFIELD PLATE"

For the silver collectors of "Sheffield Plate" it is essential to know the difference between true English Sheffield Plate and another type of fine silver plate bearing the marking "Sheffield", which was made in America in the early part of this century.

English Sheffield Plate was made in the latter part of the 18th and early part of the 19th centuries in Birmingham, Sheffield and other English cities. The early manufacturers called it "copper rolled plate". It was made of a copper base to which a sheet of silver of varying thickness was affixed by rolling and fusion. At first the silver was attached only to one side of the base metal; later, to both sides, so that a sugar bowl could have silver on the inside as well as the outside.

The Sheffield fusion method had been accidentally discovered about 1742 and was increasingly used until about 1835-1839 when a medical student named Wright discovered, also accidentally, the process of electrodeposition of silver on base metals. Student Wright sold his invention to a manufacturing firm which immediately used this new method.

After the middle of the 19th century the original rolled and fused type of Sheffield Plate was no longer made. However, in 1912, R. Wallace and Sons, Mfg., the founding company of present day Wallace Silversmiths, Inc., Wallingford, CT, made a line of fine silver electroplated holloware following the designs of the earlier English Sheffield pieces. These were marked "Sheffield" and were described in the April 1912 issue of "The Wallace" magazine.

UPCOMING EVENTS

CONFERENCES

July 25 - Aug. 1, 1980, General Assembly and International Conference, to be held in Vienna, Austria.

Oct. 12 - 19, 1979, XI Congress and Assembly of the International Council of Societies of Industrial Design. The theme will be "Industrial Design as a Factor in Human Development" to be held in Mexico City. For more information write: XI Congress and Assembly - ICSIC '79, Inswigente Sur 753, 9th Floor, Mexico 18, D. F.

Oct. 10-13, American Crafts Council Southeast Conference, held by the Southeast Regional Assembly of the American Crafts Council at the Arrowmount School of Arts & Crafts in Gatlinburg, TN. For brochure, write: ACC-SE Conference, Arrowmount School of Arts & Crafts, Box 567, Gatlinburg, TN 37738.

Nov. 16-18, The Fourth International Craft Film Festival, to be held at the Fifth Avenue Cinema in NYC in cooperation with the New School for Social Research. The festival is being sponsored by New York State Craftsmen, Inc. For more information, write them at: 37 W. 53rd St., N. Y., NY 10019, (212) 586-0026.

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EXHIBITIONS

The following exhibits will be held at concepts in Carmel, CA:
Paul Mergen - Oct. 5-Nov. 4
Edward De-Large - Nov. 16 - Dec. 30
Helen Shirk - April 4 - May 4, 1980
Lynda LaRoche and David Rodgers - May 30 - June 29, 1980
Wendy Ramshaw and David Watkins - Oct. 10 - Nov. 16.

Also, dates have not yet been established for these: Miriam Sharlin, Bjorn Weckstrom, Karel Bartosik and Catherine Mannheim.

Los Angelos, CA, Faberge Show, June 7 - Oct. 28; The show then moves to Peoria, Illinois, from Nov. - Jan 1980.

Gatlinburg, TN, "Gatlinburg Craftsmen's Fair," Oct. 12 - 21, to be held at the Civic Auditorium, for more information contact: Everett Brock, Craft Center, Box 1776, Parkway East, Gatlinburg, TN 37738.

Asheville, NC, 32nd Annual Guild Fairs, Oct. 17 - 20, to be held at the Asheville Civic Center, for further information contact: James Gentry, SHHG, P. O. Box 9545, Asheville, NC 28805.

Gaithersburg, MD, National Craft Fair, Oct. 17 - 21, to be held at Montgomery County Fairground, for more information contact: Noel Clark, Director, National Crafts Ltd, Gapland, MD 21736.

Winston-Salem, NC, 16th Annual Piedmont Crafts Fair, to be held at Winston-Salem Coliseum, for more information contact: Lida Lowrey, 3000 S. Main St., Winston-Salem, NC 27101.

St. Louis, MO, "15th Anniversary Multi-Media Members," Dec. 2 - Jan. 2, to be held at the Craft Alliance Gallery.

St. Louis, MO, "Soft Objects & Enamels," Jan. 6 - 30, to be held at the Craft Alliance Gallery.

Washington, D. C., "The Art of Russia: 1800 - 1850," Aug. 3 - Nov. 11, to be held at the Renwick Gallery, Smithsonian Institute.

Washington, D. C., "Jewelry by Irena Brynner, Sept. 28 - Jan. 13, at the Renwick Gallery, Smithsonian Institute.

Brookfield, Conn., "Brookfield 25," June 17 - Sept. 11, at the Brookfield Craft Center, Inc.

Philadelphia, PA, "The Third Annual Philadelphia Craft Show," Nov. 15-18, Memorial Hall, Fairmount Park.

London, Ontario, Second Annual London Christmas Craft Sale, Dec. 5-9, Progress Bldg. Western Fairgrounds.

Layton, NJ, The Gallery Peters Valley, presents the following exhibits: Fine Forgery—Oct. 6-Nov. 7; Sacred & Ceremonial—Nov. 17-Dec. 24.

Asheville, NC, "32nd Annual Guild Fairs;" Fall Fair—Oct. 17-20; Asheville Civic Center.

Toronto, Canada, "The Treasures of Tutankhamun," Nov.-Dec., to be held at Art Gallery of Ontario, only Canadian showing of this exhibition.

Carmel Valley, CA, Oct. 5-Nov. 4, Paul Mergen & Brenda Mergen; Nov. 16-Dec. 30, Edward DeLarge at the Concepts Gallery.

The Helen Drutt Gallery, Spruce St., Philadelphia, PA, is presenting these one-person exhibits this fall. Rise Rice, Bruce Metcalf, Albert Paley, George Timock, Wendy Ramshaw, David Watkins.

San Francisco, CA, "Pacific States Craft Fair," Aug. 2 (buyers), Aug. 3-5 (general public). Ft. Mason facilities.

Morristown, NJ, "Morristown Craftmarket," Oct. 5-7.

"Silver in American Life," Everson Museum of Art in Syracuse, NY, July 29-Sept. 30; High Museum of Art, Atlanta, GA—Nov. 3-Dec. 31; Amon Carter Museum, Ft. Worth, TX—Feb. 8-Apr. 13, 1980; Milwaukee Art Center, Milwaukee, WI—May 16-June 20, 1980; Virginia Museum, Richmond, VA—Sept. 19-Oct. 19, 1980; St. Louis Art Museum—Dec. 6, 1980-Feb. 1, 1981; Los Angeles Museum of Art—Mar.5-May 10, 1981; Cleveland Museum of Art—June 24-Aug. 16, 1981; Denver Art Museum—Sept. 23-Nov. 15, 1981; Fine Arts Museum of San Francisco, M.H. deYoung Memorial Museum—Dec. 19, 1981-Feb. 14, 1982; and Detroit Institute of Arts—Mar.24-May 16, 1982.

Madison, IN, Tenth Annual Chautauqua of the Arts, Sept. 29-30. For more information, write to: Mrs. Diane McDonough, 1119 W. Main St., Madison, IN 47250.

Asheville, NC, Southern Highland Handicraft Guild Fair, Oct. 17-20, to be held at the Civic Center.

Windsor, Ontario, Second Annual Windsor Christmas Craft Sale, Nov. 23-26, at the Cleary Auditorium.

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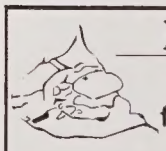

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WORKSHOPS

Brookfield Craft Center presents the following workshops this fall:

NEW PHOTOETCHING TECHNIQUES FOR JEWELRY — John Crawford
Saturday & Sunday, Sept. 15, 16

INTERMEDIATE JEWELRY — Anne Besse-Shepherd
8 Tuesdays, Sept. 18 - Nov. 6

JEWELRY TECHNIQUES II — Jean Greenwald
10 Wednesday Evenings 7-10 pm
Sept. 19 - Nov. 21

JEWELRY TECHNIQUES I — Florence Benzer
6 Wednesdays, Sept. 26 - Oct. 31

METAL METHODS WITH CLOISONNE ENAMELING — James Bennett
Saturday & Sunday, Sept. 29, 30

CLOISONNE ENAMELING — Florence Benzer
2 Saturdays & 2 Sundays
Oct. 13 - 28

STONESETTING — Pat Flynn
Saturday & Sunday, Nov. 3, 4

TOOL MAKING FOR JEWELERS — Pat Flynn
Saturday & Sunday, Nov. 10, 11

For further information contact . . .
Brookfield Craft Center, Inc.
P. O. Box 122
Brookfield, CT 06804
(203) 775-4526

Revere Academy of Goldsmithing presents the following workshops beginning the first week of October:
Pave Diamond Setting
Stone Setting
Goldsmithing
Hand Engraving
Enameling
Jewelry Repair
For further information, write: 760 Market St., Suite 937, San Francisco, CA 94102; 415/391-4179.

GIA presents the following classes:

DIAMOND GRADING CLASS:
Aug. 20-24 . . . . . Miami, Fla.
Aug. 27-31 . . . . . .N. Y., N. Y.
Sept. 10-14 . . . . . .N. Y., N. Y.
Sept. 10-14 . . . Kansas City, MO
Sept. 17-21 . . Santa Monica, CA
Sept. 24-28 . . . . . .N. Y., N. Y.
Sept. 24-28 . Oklahoma City, OK

GEM IDENTIFICATION CLASS:
Aug. 27-31 . . . . . Miami, Fla.
Sept. 17-21 . . . . . .N. Y., N. Y.
Sept. 17-21 . . . Kansas City, MO
Sept. 24-28 . . Santa Monica, CA

JEWELRY DESIGN CLASS:
Aug. 27-31 . . . Santa Monica, CA

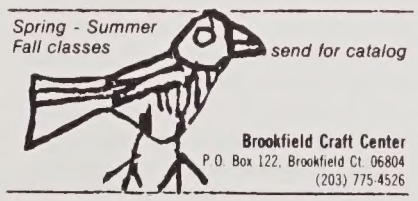
DIAMOND SETTING CLASS:
Sept. 10-21 . . Santa Monica, CA

JEWELRY REPAIR CLASS:
Sept. 24-Oct. 5 Santa Monica, CA

WAX CARVING AND MODELING CLASS:
Sept. 10-21 . . Santa Monica, CA

For more information and enrollment application, write: GIA, 1660 Stewart, P. O. Box 2110, Santa Monica, CA 90406.

Aug. 4 & 5, "Plastics in Jewelry" by Amy Davison, tuition $40 for members of the American Crafts Council and $45 for non-members. For information write: Carolyn A. Hecker, Greenwood Gallery, Suite 905, 1025 Connecticut Ave., N. W., Washington, D. C. 20036, or call (202) 833-2910.



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OPPORTUNITIES

The Craft Center in Worcester, MA is always looking for serious craftspeople interested in serving as part-time adjunct faculty or weekend workshop leaders. We are looking particularly for programs in ceramics, metalsmithing, wood-working, calligraphy, stained glass, enameling and super 8 moviemaking, but craftspeople in any field may send inquiries. Interested teachers should send a resume and course or workshop proposal to: Educational Coordinator, Craft Center, 25 Sapamore Rd., Warcester, MA 01605.

Helen Drutt is planning a major invitational metal exhibition in 1981. Work is presently being reviewed and material can be forwarded to: Helen Drutt, Director of Moore College of Art Gallery, 20th & Race Sts., Philadelphia, PA 19103.

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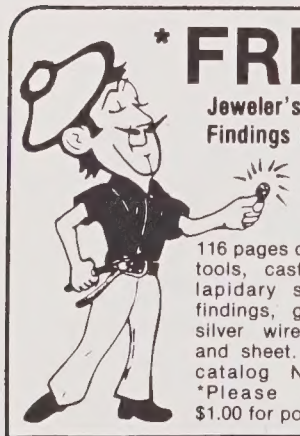
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EXHIBITION OPPORTUNITIES

Sacred & Ceremonial, A Multi-Media Holiday Exhibition at The Gallery, Peters Valley (Nov. 17 - Dec. 24). Open to all craftsmedia. Juried by slides and review of actual work upon arrival. Fee: $4 per entry, maximum 3 entries per person, 1-2 slides per entry. Slides due Sept. 1. Write Susanne Turino, The Gallery, Peter's Valley, Layton, NJ 07851.

Containers: A juried competition of objects co-sponsored by the Danforth Museum and the Massachusetts Association for the crafts at the Danforth Museum, Framingham, MA, Nov. 1 - Dec. 31, 1979. Open to all craftspeople who are full-time residents of MA. All media-slides and application forms due Aug. 17, 1979. Write: Containers, Danforth Museum, 123 Union Ave., Framingham, MA, 01701.

Oct. 18 - Dec. 1, Aaron Faber Gallery is mounting a group exhibit of jewelry in multi-colored golds, wearables only. Notify the gallery as soon as possible if you wish to participate and the number of pieces. Please send resume and any black and white photos may be used for press releases. Write Patricia Kiley, Aaron Faber Jewelry, 666 5th Avenue, NY, NY 10019.

Deadline Date: Sept. 14, 1979, Platinum Jewelry Design competition, platinum designs for men without gems or women with or without gems. Finalists are chosen from sketches and then supplied with platinum to make up the designs. Contact: Johnson Matthey & Co., 608 Fifth Ave., NY, NY 10020.

Deadline Date: Oct. 1, 1979, Feb. 16 & 17, 1980, "The Fourth Annual Winter Market of American Crafts," at the New Baltimore Convention Center, Pratt Street, Baltimore, MD. Applications accepted in all craft media from professional craft persons living anywhere in the U. S. For more information write: Carol Sedestrom, President, American Craft Ent. Inc., P. O. Box 10, New Paltz, NY 12561.

Deadline Date: Oct. 10, 1979, "Light Work," Jan. 20 - Mar. 7, Philadelphia. A show of work open to all craftspeople and mediums dealing with giving off light. Commission 60-40, all work insured. Write: Jane Blend, Sign of the Swan, 8433 Germantown Ave., Philadelphia, PA 19118, or call (215) 242-5300.

Deadline Date: Nov. 1, 1979, Feb. 3 - Mar. 2, 1980, Concepts in Metal: The Figure, open to any craftsperson in U. S., for more information write: Mary Lee Hu, Art Dept., Michigan State University, East Lansing, MI 48824.

Deadline Date: Oct. 15, 1979, Nov. 16-18, 1979—The Fourth International Craft Film Festival, all 16mm films dealing with any aspect of traditional or contemporary crafts (with the exception of "How-To" films) are eligible for competition in the festival. "Crafts" here are defined as anything hand-made. For more information and entry blanks, contact: International Craft Film Festival, New York State Craftsmen, Inc., 37 W. 53rd St., New York, NY 10019, (212) 586-0026.

Deadline Date: Oct. 15, 1979, "Young Americans: Metal, a national competition sponsored by the American Crafts Council for young craftspeople between the ages of 18-30, working in metal and enamel. The works must be original and executed by the entrant in the past two years. For more information and application, write: Young Americans, Metal, American Craft Museum, 44 W. 53rd St., N. Y., NY 10019.

Slides Due: Sept. 8; Oct. 27-Nov. 25, "Marietta College Crafts National '79, 8th Annual Craft and Sculpture Exhibition," $5,000 in prize money: $1,000 Award of Distinction, $2,500 Judges Awards and $1,500 Purchase Award. Maximum 3 pieces; $10 entry fee. For a prospectus, write: MCCN '79, Arthur Howard Winer, Director, Marietta College, Marietta, OH 45750.

Sugarloaf's 1979 Shows: for detailed information on these, send full size SASE to: Ms. Deann Verdier, Director, Sugarloaf Mountain Works, Inc., P. O. Box 319, Poolesville, MD 20837:

1. Oct. 12-14, Timonium, MD, "3rd Annual MD Crafts Festival" at MD State Fairgrounds; space fees $100.
2. Nov. 16-18, Gaithersburg, MD, "4th Annual Autumn Crafts Festival" at the Montgomery Co. Fairgrounds; space fees $100.
3. Dec. 7-9, Gaithersburg, MD, "2nd Annual Winter Crafts Festival" at Montgomery Co. Fairgrounds; space fees $100.

Feb. 2 - Mar. 15, 1980, "It's About Time," a national competition and exhibition of handmade one-of-a-kind clocks, clock movements and time-related craft objects to be held at the Craft Center Gallery. Juried by slides; for a free prospectus, write: It's About Time, Worcester Craft Center, 25 Sagamore Rd., Worcester, MA 01605.

Creative Fairs presents the following shows:

1. Nov. 16-18—"5th Annual Harvest Crafts Festival," Naussau Coliseum, Uniondale, LI, NY.
2. Nov. 25—"Super Crafts Sunday," 111 Meadowlands Complex, East Rutherford, NJ.
3. Nov. 30 & Dec. 1-2—"NY Contemporary Craft Exposition," Park Ave. Armory, NYC, NY.

(These shows are juried by slides. For more information, write: Creative Faires, Ltd., P. O. Box 1688, Westhampton Beach, NY 11978.)

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EDITORIALS

Dear Editor,

We are having a show of Edward DeLarge's titanium work . . . and he is coming here for the opening. We would like to arrange some speaking engagements for him around Nov. 16. Also, we are having Wendy Ramshaw and David Watkins over on or about Oct. 10, 1980, and they too would like to arrange some speaking engagements at various universities . . . interested parties can contact me at Concepts, Sixth & Mission, P.O. Box 301, Carmel, CA 93921.

Doug Steakley

Dear Editor,

I hope to make my own gold alloys soon and while trying to find information on the subject was quite disappointed with the lack of detail on the subject.

Philip Morton's book "Contemporary Jewelry", Oppi Untracht's book "Metal Techniques for Craftsmen" and Wilhelm Braun-Feldwig's book "Metal Design & Technique" all lacked the detail needed for the process.

In one instance, Feldwig notes that while making a 14k or 18k alloy using gold, silver and copper, it is "important to chill thick pieces in methylated spirit as the red heat disappears." I think I can find out what methylated spirit is, but I have gotten the feeling that even if I alloyed pure gold and pure silver in different proportions, I may run into problems, i.e. flow properties (for casting) or cold-working brittleness. I searched through these books and could not find out the resultant properties of mixing gold and silver or gold, silver, and copper in certain proportions. Feldwig's book gave melting point and color, but are there other chemicals, such as methylated spirits, that are necessary or prescribed in alloying?

Maybe I am being overly cautious, but it would bother me to ruin some 24k gold while trying to make an alloy.

One other thing, I have noticed these books (as thorough as they are) also do not give dwts. per square inch, or dwts per foot for 20k, 22k, or 24k gold. All the weights stop at 18k.

Maybe there is a book devoted to gold and its alloys , and possible problems, that you could direct me to.

Linda Barba

(EDITOR'S NOTE: Anyone able to assist Linda, please write and we'll run the answer in the Journal.)

Dear Editor,

Lida Lowrey concluded her review of Robert Ebendorf's jewelry exhibition summarizing the work as "Strong, Sophisticated, but Safe." I interpreted her capitalization and placement of the word 'safe' at the end of her sentence as being a point she particularly wanted to emphasize in a slightly derogatory manner, since safe has a connotation of bland, overly restrained — aesthetic ideals restricted by the confinements of wearability.

Is the concept of wearability a subsidiary consideration in the creation of a piece of jewelry? Must a craftsman create sensationalistic, orgiastic, ten-pound monstrosities to enable his work to be elevated to the realm of fine art? If a craftsman is giving his objects the function of wearability he should fulfill that commitment by giving consideration to the weight, comfort, and visual impact of the work. The weight and comfort being defined as not damaging the clothing, skin, or bone structure of the wearer, and visual impact as enhancing, not dominating the wearer. This last point is certainly wide open to interpretation, but it is my feeling that jewelry is a personal form of art utilized by the owner, and that the emotions and ideas expressed through a piece of jewelry should be tempered so as not to reduce the wearer into becoming merely a walking pedestal. Few individuals have such powerful personalities that they are able to transcend large body ornaments. Should the craftsman only design his works with this extremely limited minority in mind?

If the craftsman does not wish to deal with the restraints imposed by wearability, why give an object the appearance of functionality at all? Just discard the functional aspects and find the courage to call it sculpture. The act of creating a wearable piece of jewelry should not lower the craftsman to the status of a 'worker in the lesser arts.' A cursory glance at any of the works of Frank L. Wright give evidence of an artist, although working in the very tight confines of creating a stimulating, habitable environment, still able to infuse that work with the stamp of his personality.

I am not suggesting that working within the limitations of designing for the body is by any means more or less difficult than creating a piece of sculpture. Each discipline has its own problems and considerations. I am arguing that an artist is not compromising himself by working within the limitations of wearability.

David Benedek

Dear Editor,

In communicating with several of the major craft organizations, I have been surprised to learn that there is no credit rating of galleries to help the craftsperson from getting burned by the occasional rip-off gallery.

Last year I consigned a quantity of gold jewelry to the Aaron Faber Gallery of NYC. I am currently involved in the lengthy and costly process of bringing a civil suit against Mr. Faber and will be fortunate if I can recover my costs. The $3,000 worth of pieces that he sold could have established for me a good on-going relationship with a responsible gallery.

The law in this type of arrangement strongly favors the fraudulent party. I am aware that many other craftspeople have had similar experiences, but am confused why there is no protective device available to us within the body of the craft organization. I would have been spared much time, money, and aggravation if there had been a central rating service to apply to, prior to getting involved with this gallery.

Dr. Henry M. Kesselman

EDITOR'S NOTE: Because of the variety and nature of the Letters-to-the Editor, SNAG and the Goldsmiths Journal cannot verify or be responsible for the material these letters may contain. It is therefore suggested that you carefully analyze and verify all information herein. We will consider publishing responsible letters which refute any information we publish.

CORRECTION

In Journal 21, we published an article by Kim Bass on tube setting which contained some errors. We now have a corrected version of this article and will forward a copy, free of charge, to any SNAG member. Write us at the Journal, requesting this reprint.

OOPS! PARDON US. . . .

The belt buckle credited to Bunt in the diamond assignment article, June Journal, was in actual fact a brooch designed by John Cogswell. Below is a rerun of John's brooch with proper caption.

John Cogswell, brooch, sterling, 14k gold, diamonds

TECHNICAL INFORMATION

A HELPFUL HINT FOR SAVING TIME AND MONEY ON NEGATIVES FOR PHOTOETCHING

by Norman V. Lanquist

I hadn't much lead time after receiving the flyer of guidelines for materials and such, before I had to make the trip to attend Eleanor Moty's March 10-11 Phoenix workshop on photoetching; no time to initiate the inconvenient and expensive Kodalith negative-copy process at a photographic specialist several hours away. Nor did I have the time to conceive and execute acetate transparencies with opaque ink or black tape as was suggested in the flyer.

What to do? My goal was to arrive at the workshop with completed transparencies to avoid having either to concoct some on site or to — argh-h-h borrow from another participant! I wanted as much time as possible to be totally involved with the photoetching process and not have it frittered away on making up negatives; neither did I want to rely on the unknown designs of an unknown person for something to be bitten forever in metal!

I took the approach that was to me the most obvious from the standpoint of cost and convenience. Having a little background experience in publication graphics, an active interest in pictorial fiction (comic books), and familiarity with classroom teaching audio-visual technology, I did the following: Understanding the design should be relatively simple with high contrast, but without an excess of chiaroscuro, I chose for my originals published black and white line drawings, with background zipatone or Chartpak dot patterns to lend richness of visual texture to the overall effect. Then I made a high contrast photocopy on the college library's 3M "Secretary II," which yielded a paper page I didn't have to rend from my *Savage Sword of Conan No. 1.* Next, I proceeded to make a transparency on the 3M "Ninety Six" photocopier, designed expressly for creating transparencies from print copy. The process is intended to produce teaching aids to be used in classroom overhead projectors. The medium used in Labelon Projection Transparencies (Infrared).

I was done; that was it. Total time: oh, maybe a half-hour or so for several negatives, counting the time I messed around, mused at the results, and adjusted the exposure time of the two copiers for the best balance of detail rendition and deepest black. Total cost to me: nothing; to the institution, a few cents. There are limitations to the process — no change can be made in the picture size from the original to the final etching since it's a lensless process. Secondly, one needs to examine and evaluate deterioration of detail in successive generations of copies. The degeneration phenomenom is very real, as anyone knows who has ever paid close comparative attention to photocopies of photocopies.

Applications of this process to metal work and its final appearance are varied. If one wanted the half-tone photo effect as exemplified in Eleanor Moty's work, then one must start with a half-tone positive print with large, distinct dots. Myself, I would tend toward line drawing; however, things being as they are these days, copyright could be a sensitive issue if you use, for profit, published sources of graphic artists' works. Possible sources though could include 16th-century engravings or Victorian advertising if you monitor your copy for fine line rendition. (You're on your own for tastefulness or camp.) German Expressionist woodcuts have possibilities for broad areas of high contrast, though pin-holding of blacks in the final etch might be a problem. Finally, if you wanted to use your own original design, you might as well draw right on an etching ground in the time-honored fashion, since as Eleanor admonished us — you must decide before you begin the photoetching process if this approach is the only appropriate one for the desired final effect.

HELPFUL HINTS

by Vada Beetler

Ivory cracks while working if it gets hot, wet or dry. Work by hand, hacksaw, jewelers' saw, graver, knife, file or rasp. Vibrations of power tools can cause cracking. Keep ivory rubbed down with oil — seal and whale oil being traditional — mineral oil has been used today.

After sanding with increasing finer grades of sandpaper, persistent rubbing with the ball of the thumb or a soft skin with a light oil will give a high polish. One ivory worker uses dry Bon-Ami on felt. The oil treatment should be repeated yearly to prevent cracks and never, never store or display near a heated area.

HELPFUL HINT

by John Satterfield

To attach a paper design on metal for sawing, melt a little wax and drip onto sheet metal to be cut. While the wax is liquid, slide the design to the proper location and warm the metal so that the wax penetrates the paper. Cool with water. The wax protects the design from smudging and lubricates the saw blade.

Very beautiful [iridescent] colors can be produced on copper, brass or bronze with a platinum solution composed of about one grain of platinum to five liters of water, according to a foreign exchange. The platinum has previously been reduced into chloride in the same manner as gold. The articles to be colored are first cleaned and then thoroughly scoured, after which they are dipped into a solution composed of 40 grams of tartar and five liters of water. Heat this solution immerse the article and then dip into the platinum solution and keep in contant motion. The change of color takes place in a few minutes, after which the articles are rinsed in water and dried in sawdust. By regulating the strength of the solution and time of immersion almost any desired shade is obtained. A good colorless coating of lacquer must then be applied. ("The American Jeweler", compliments of V. Beetler)

HELPFUL HINT

by Ed Levin

If you use that BIC lighter as a sparker for your torch, keep it well out of range of your torch . . . or you may have an unpleasant explosion-fire surprise!

HELPFUL HINT

by Rob Hallett

The useful range of the Hoke gas/oxygen torch can be extended. To get a pin point flame, solder (lead is ok) about ¾" of hypodermic size stainless tubing into the hold of a standard tip (my tubing has an outside diameter of just over 1 mm). Careful control of gas volume and pressure will give a 1 mm x 5mm flame. To get a big bushy flame, drill, burr and polish a big smooth walled hole through a standard tip. The hole must be shaped and polished to allow the gasses to flow smoothly.

CLADDINGS ON COPPER OR ITS ALLOYS

A smooth material for electronic parts is obtained by appropriate annealing of silver clad onto copper or a copper alloy. The material is particularly useful for sliding connections which require low noise and low contact resistance.

A 20 millimeter thick plate of phosphor bronze, for example, is clad with a 2.86 millimeter thick sheet of silver. This composite is rolled to a thickness of 0.4 millimeter and then annealed.

It is found that the size of ripples in the surface and the size of the grains formed during annealing can be controlled by adjusting the annealing temperature. Thus a 450 C (842 F) annealing temperature gives a smooth surface whose grains are only 8 microns in size and whose ripples are only 4 microns high. An annealing temperature of 550 C (1220 F), by contrast, results in grains which measure 22 microns in diameter and ripples which are 12 microns high.

The copper or copper alloy can be clad with alloys of silver as well as with pure silver. Gold and gold alloys can also be used for cladding. (In Japanese)

Miyomi Toya, Shirubenia K.K., Care of Japanese Patent Office, 3-1 Kasumigaseki, 1-chome, Chiyoda-ku, Tokyo, Japan, *Japanese Kokai Patent* 77 78, 740, July 2, 1977.

RETURN TO THE FORGE (EXTENDED RESEARCH INTO MOKUME-GANE AND GRANULATION)

by Members of the Graduate Program Southern Illinois University/Carbondale: Marvin Jensen, Phil Baldwin, Steve Brunst, Lori van Houten, William Ard, Janis Nathan, Randy Jones, Prof. L. Brent Kington, Prof. Richard Mawdsley

compiled and edited by William Ard
February 1979

INTRODUCTION—Unsuccessful attempts by modern technology to duplicate ancient metalworking techniques may have failed partly because they ignored the technology of the men who invented them. Neither the Etruscans nor the ancient Japanese had modern kilns or chemistry, but they did have a firm grasp of granulation, solderless joints and mokume-gane.

Interest in blacksmithing at Southern Illinois University has led to an exploration of forge joining techniques. As the coal forge or charcoal brazure was the only heat source available to the ancient smith, we consider that it created a distinct and possibly beneficial environment. This has led us to explore the use of the reduction environment as a tool.

Marvin Jensen, mokume vase form of copper, shakudo and shibuichi

BACKGROUND—SIU experimentation into forge welding began in 1969 with the development of a pattern-welded method of making "Damascus" steel. The research team at that time (no. 1) evolved a method of making patterned steel by forge welding alternating layers of steels having varying carbon, sulphur and nickel contents.

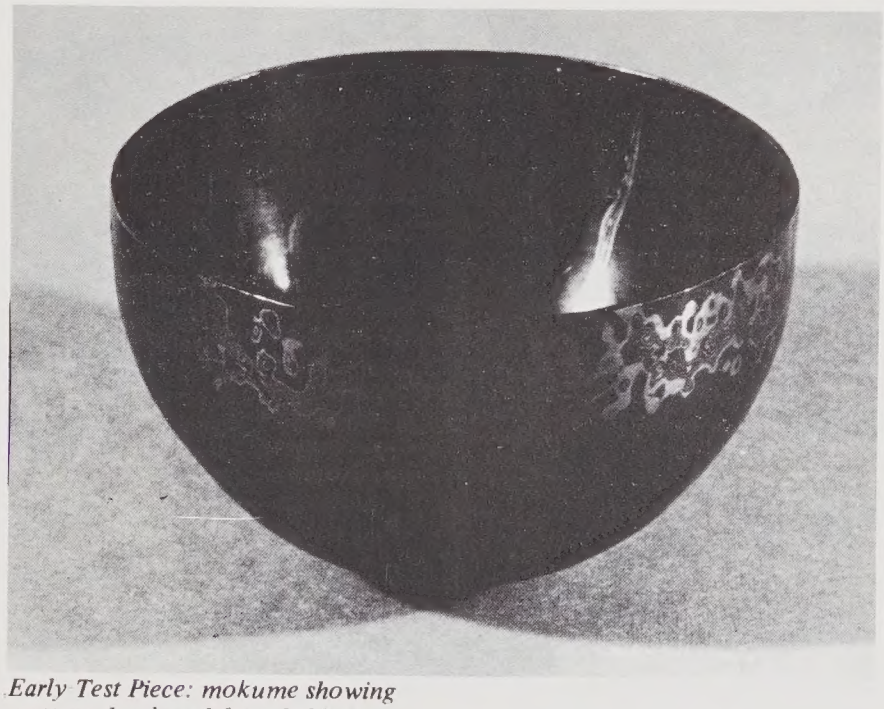
Additional pattern was developed by the mechanical processes of material removal by chiselling or grinding, surface distortion by hammering, or by twisting; subsequently forged or ground flat, the finished billet had a cuttle-bone or wood grain texture that could be brought out with a light etch.

These methods and their results have been documented in some detail in "Decorative and Sculptural Ironwork" by Meilach. (no. 2)

Phil Baldwin began using a traditional Japanese method for patterned steel in 1974. As stated in Robinson (no. 3) the process consists of the forge welding of two layers of different steels. This billet is then folded and rewelded some 15 to 20 times resulting in over 1,000 layers of steel, with carbon repeatedly being introduced by putting straw ash in the welds.

A fine, delicate pattern is developed by the folding process, but additional pattern can be developed by exposing the stratification by the means mentioned above, or by simply forging the billet at an angle and exposing the edge of the layered stack in a wood grain effect.

At this point investigation began into the bonding of non-ferrous metals. Early readings in C.S. Smith's "History of Metallography" (no. 4) led to capillary quench diffusion bonding. This method of quenching rivetted layers of various alloys into molten metal gave a bond that was only occasionally successful. Done properly, the process resulted in a strong, malleable bond, but was abandoned due to superior results in forge welding.



Early Test Piece: mokume showing pattern developed from behind by dapping and filing.

Sheffield plating (or "silver cladding") (no. 5) was also looked into at this time, but though successful with silver, copper and copper alloys, it was less efficient than forge welding and set aside for future study. Experimentation here led us to drop the use of zinc alloys due to bond strength problems and violent silver-zinc reactions problems.

An article in a 1914 "American Blacksmith" (no. 6) taught us to forge weld copper and copper alloys successfully and turned our attention to traditional mokume-gane as a cleaner, more controllable bonding method.

Research into Japanese methods was indicated, and a 1977 exchange workshop with Gene and Hiroko Pijanowski provided much needed information on traditional copper alloys. The workshop also introduced new information on a chemical patina (Rokusho) used to differentiate the alloys in the finished piece.

One mutually beneficial discovery was the superiority of the coal-fired forge over the electric kiln in producing consistently good results; credit was given the non-oxidizing environment of the coal fire. With the new alloys we were achieving close to 100% success rate.

The final development was the introduction of the torque-plate in 1978 by Marvin Jensen. By clamping the layered stack between two steel plates, not only was our metal preparation time cut by 2/3 and a good, non-slip contact between layers insured, but properties of the metals themselves were used to insure a good bond. The difference in the

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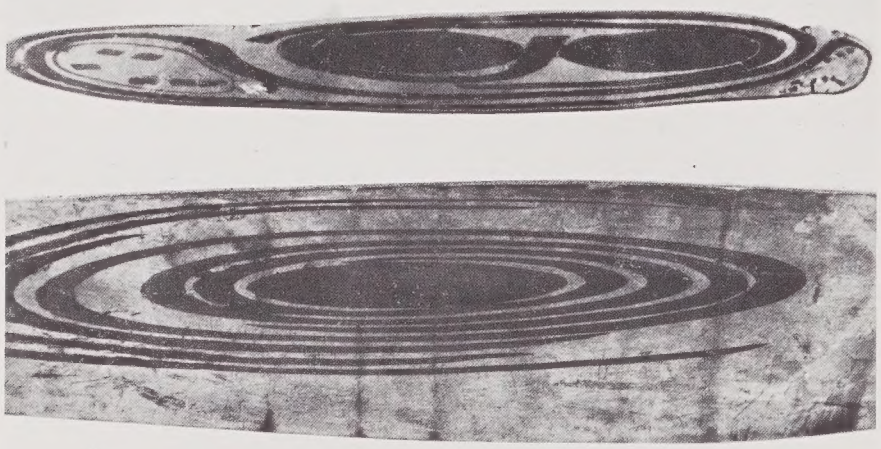
1. Daryl Meier, Robert Griffith, and Jim Wallace.
2. Decorative and Sculptural Ironwork; Meilach; pp. 216-232.
3. Art of the Japanese Sword; Robinson; pp. 25-26.
4. History of Metallography; Smith.
5. History of Old Sheffield Plate; Bradbury.
6. Forge Welding Copper and How It's Done; Constantine; p. 291.



Early Test Piece: rolled capillary quench billet.

expansion coefficients of copper and steel insure that the copper alloy layers will expand faster than the steel clamps, driving out the oxygen between the layers and seating the alloys tightly against each other. (no. 7)

7. Metals Reference Book VII; Smithells; pp. 642, 646.

Steve Brunst: pattern development experiment.

MOKUME—Early attempts to copy the mokume process included Prof. Roberts-Austin's turn-of-the-century "imitation" mokume (no. 8) where the layers of metal are hard soldered together.

A Japanese variation mentioned in Hiorns (no. 9) involved pouring semi-solidified alloys together in a box. Called kasumi-uchi (no. 10), this produced a mottled, "marble-cake" billet and a pattern is developed in ways similar to mokume.

The actual mokume-gane process, about 300 years old (no. 11), is the diffusion lamination of copper and the copper alloys shibuichi, shakudo, and kuromi-do. Silver and gold are also used. The alloys are rolled out, cut into sheets and stacked in a contrasting sequence. Traditionally the stack is placed in a steel box or bound with heavy wire with a steel plate on top to provide weight (no. 12), and then fired in a charcoal oven.

Diffusion takes place as the molecular movement within the crystalline structure of the metal is increased with the introduction of heat. This encourages the crystal lattices of the adjacent, mutually soluable metals to grow into each other across the weld boundary.

The diffusion bond is characterized by the welding of the parent metals at a temperature significantly lower than their melting points. In some cases, as with copper and silver, a eutectic alloy is formed between the two metals and the necessary welding temperature drops even lower.

The Pijanowskis used an electric kiln in the interest of scientific control and measurement, but we felt a return to the forge environment would provide an atmosphere less conducive to oxidation (no. 13).

8. Mixed Metals; Hiorns; p. 274.
9. Ibid; p. 275.
10. Workshop: Mokume-gane; Pijanowski (Craft Horizons).
11. Ibid.
12. Laminations of Non-Ferrous Metals by Diffusion; Pijanowski (Goldsmiths Journal).
13. Research team of 1977: Marvin Jensen, Phil Baldwin, Kathy Doyle, Steve Brunst, William Leth, Steve Miller, under direction of Prof. L. Brent Kington.

THE PROCESS: ALLOY TO BILLET—The first of the mokume alloys manufactured at SIU was shakudo. First found in Japan in a sword of the Mitsutada school, the alloy was used extensively along with bronze in sword furniture of that era (1335-1357 A.D.). (no. 14) It consists of a formula of copper (94-96%), silver (1½% or less), and gold (4-5%). The presence of not less than 4% gold is essential for best coloring (no. 15). Shakudo is a dark copper color and takes on a purple-black patina in Rokusho.

Shibuichi was next with a formula of copper (51-68%), silver (32-49%), and 1/10% or less of gold. First seen in sword furniture of the Ashikaga Period (1338-1573), it came in 15 different grades. The most popular grade was a formula called "sambo-gin" consisting of 67% copper, 32% silver and a trace of gold (no. 16).(Shibuichi with a higher silver content was found to have too

14. Metals and Metalworking in Old Japan; Gowland, pp. 90-94.
15. Mixed Metals; Hiorns; p. 274.
16. Metals and Metalworking in Old Japan; Gowland; pp. 90-94.

Marvin Jensen: Bank with mokume and silver construction.

low a melting point to be used safely in mokume laminates. Our alloy of 5% silver or less will not melt in the bonding process and colors, upon patination, very much like traditional Shibuichi.) It is a pale bronze color and a rich gray when patinaed.

Last is Kuromi-do, a formula of copper and 1% arsenic (no. 17). While it is not safely manufacturable in the studio, the commercial alloy is safe to use in the mokume process. It possesses a dull bronze color with a brown to blue-black patina.

Any variations of copper, gold or silver content are likely to produce alloys suitable for bonding to copper and to themselves. Pure copper, gold and silver can also be used to provide further contrast in layering.

Brass can also be included in the stack if it is kept separated from the silver alloys. Adequate bond strength can be achieved with brass, but the resulting product does not have the malleability of copper-silver-gold systems and care must be taken not to overwork the brass elements in the laminate.

Mix the alloys by weight in a clean graphite crucible. We use fine silver, fine gold, and salvage electrical copper because of its availability and its low sulphur and oxygen content. The fluxes used are sal ammoniac (ammonium chloride), against copper and zinc oxides, and borax to collect other impurities into the slag.

As the crucible is raised to melting temperature in the forge, add a little borax (do not overflux) and either charcoal or wood chips. This forms a layer of carbon on top of the alloy and prevents it from oxidizing. Great care should be taken to avoid oxygen contamination because it will cause shortness; if the product is short (i.e. brittle) it will have to be remelted.

A forge note: once the crucible is in place, it is important to keep pushing coke into the firebox and down around the crucible. If the fire is allowed to hollow out, the intense melting temperature will be lost.

When the alloy is completely liquid, stir it with a carbon rod and remove it from the forge. Do not pour the alloy too hot because crazing, an effect of a too-large crystal structure, can result if the metal is cooled rapidly from this state.

When the metal has cooled slightly, throw in more wood chips and pour while they're still flaming. This provides a strong reducing atmosphere in the mouth of the crucible to further protect the alloy while pouring.

The ingot molds should be coated with acetylene soot and heated to around 400 degrees F. This is the temperature at which paper chars and is hot enough to keep the metal from freezing too quickly. Pour slowly and evenly down the side of the mold to prevent splashing and inclusions. There is no need to skim the carbon from the metal.

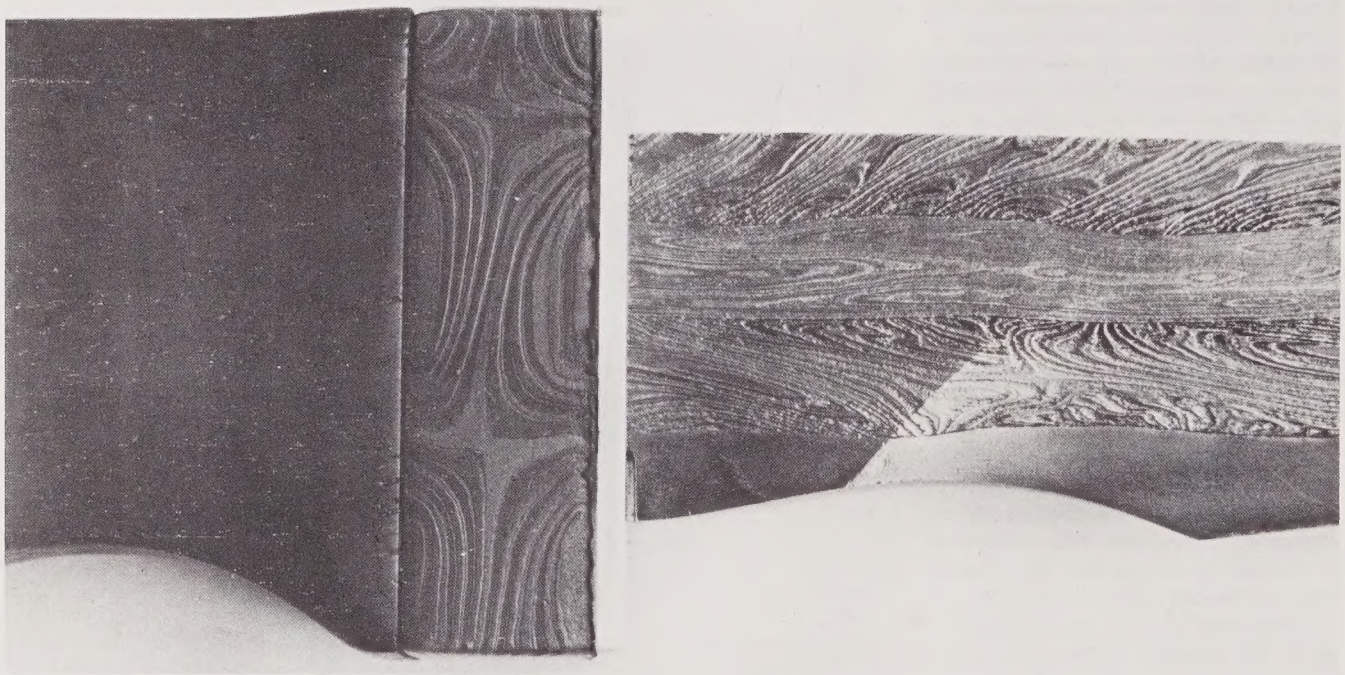
Hot forge the ingot lightly to align the crystal structure and improve plasticity. We suggest a plasticity test on the quenched ingot at this point: clamp it in a vise and bend. A fracture indicates shortness from oxygen or other impurities and the ingot should be remelted.

17. Laminations of Non-Ferrous Metals by Diffusion; Pijanowski.

Marvin Jensen: Bank (copper, shibuichi, kuromi-do) raised from end slice of 33 layer billet, 2½" dia.

Forged mokume billet of 32 layers showing first rounded pattern cut (billet measures 5"x5"x1¼").

Phillip Baldwin: Man's Bracelet in silver-copper mokume; pattern developed by twisting and punching.



Phillip Baldwin: closeup of Fuchi twist pattern mokume knife fittings on a twist section Damascus blade.

Otherwise, roll the ingot out and cut it into sheets. Make sure all the layers are reasonably clean and flat; minor warpage and scratches are permissible, but oxides and oils should be removed by pickling and a light pumice scrub.

Then stack in any sequence, usually at least eight layers, bearing in mind contrast and the possible migration of the arsenic in the kuromido, which could darken the color of the layer next to it. The bottom layer, to make the most of the pattern possibilities of the laminates, should be a thick sheet of copper. We use a 3/8 inch electrical bus bar, a "clean" alloy available in heavy plates. This layer will form the inside of the finished piece and allow the use of all the laminated layers in pattern development.

Clamp the layered stack in the torque plate. For the construction of the torque plate, use a ¼ inch to ½ inch steel plate, top and bottom, depending on the size of the billet, and six to eight 3/8 inch bolts. Mild steel works very well, though an "s" type or stainless steel would last longer and oxidize less. Some sort of parting medium such as ochre should be put between the copper and the steel to prevent fusion, and the bolts tightened to around 50 ft. lbs. for a large billet. This insures good contact between the sheets and guarantees no slippage. It also sets the stage for expansion pressure to help insure a clean bond.

The heat for a large billet should be done in a hooded fire using "blacksmiths" or "metallurgical" coal, which is high in BTU output and low in sulphur and ash. A hooded fire is one which is roofed over with dampened coal ("green coal") like an igloo with a firebrick arch in front to receive the billet.

This type of fire is built by pushing dry coke over the fire, making a small mound, and then covering the mound with green coal. Fed with air from the tuyere below, the mound will quickly hollow out, leaving a coke walled oven filled mostly with gas from the fire underneath and very little oxygen. Finally, slide steel flatstock across the fire to support the billet and push the billet into the fire.

A hooded fire is recommended, particularly for those unfamiliar with a coal forge, but a trench fire can also be used with the torque plate. With this method a handle is welded to the torque plate and the billet is placed directly into the fire, buried in the coals. The trench fire is easier to make, but it has two drawbacks: it is difficult to see the billet and check on the progress of the diffusion, and it is very easy for the uninitiated to melt the billet.

Taking care not to let the fire die down, rotate the billet in the hooded fire to avoid burning the back corners. The steel plates will prevent this to some extent, but the side away from the doorway tends to overheat.

At some point after the billet has achieved an even, red-orange glow, a "shadow" will darken the whole billet for a moment. This is a sign of a rapid drop in temperature or other molecular activity; it is, at any rate, a cue that the diffusion is almost complete.

The diffusion of copper alloys will occur at approximately 2/3 the melting termperature of the metals, happening gradually between 1400 and 1900 degrees F. Copper and silver, having a high degree of mutual soluability, will bond at 2/3 the temperature of the alloy that forms between them, between 1100 and 1400 degrees F.

In an article in the Goldsmiths Journal (no. 18) John McClosky mentions a way to calculate the precise

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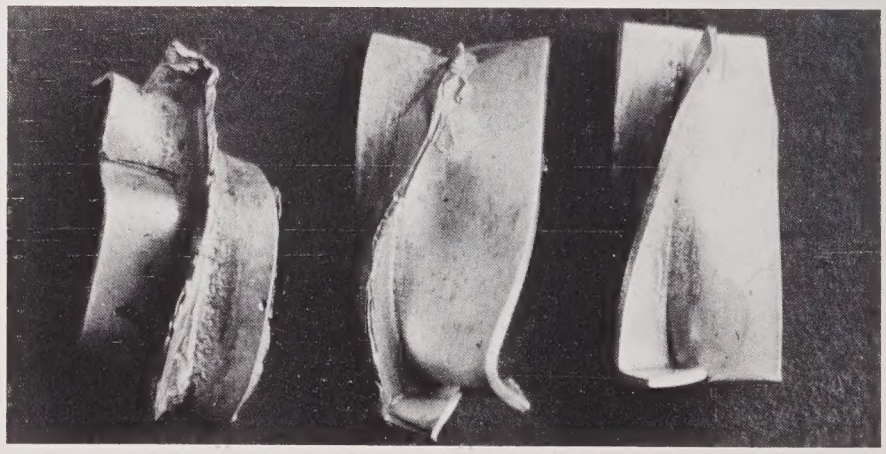
18. A Metallurgical Analysis of the Lamination of Non-Ferrous Metals; McClosky (Goldsmiths Journal No. 16).

Bond strength tests on fine silver. From left to right: CuChloride and Antimony 03 80/20, CuChloride and Antimony 03 50/50, Antimony 03 alone.



time and temperature to fire any particular billet. For our purposes, however, it is much easier to watch the visual indicators of the metals themselves and take the billet out when it is done.

When the shadow has passed and the temperature builds back to where it was, reach in and scratch the joints and across the layers with a stainless steel probe. A "silvering" or a mercury-like shine in the scratch indicates the diffusion has taken place. Remove the billet and, placing it on the anvil, strike it lightly and rapidly, working around the top of the steel plate.

Take the torque plate off, cut it off if necessary, and return the billet to the fire. Forging improves the quality of the joint, so we generally work the billet down to 50-60% of its original thickness immediately. Work from a cherry red heat into black; a higher heat won't hurt the bond, but it will promote arsenic migration if kuromi-do was used.

While this may seem a complicated procedure for the average jeweler in his studio, we should point out that although our largest billet was a four inch cube of 32 layers weighing 16 pounds, the smallest was a ¾"x5/8" billet of 8 layers and was fired in a trench fire in 15 minutes.

Using the torque plate, excellent results could be achieved in an electric kiln as well, with a localized reduction environment provided by painting hide glue on the sides of the billet. This would quickly turn to a layer of carbon and help prevent oxygen contamination.

With the invention of the torque plate, bonding success was taken for granted and we turned our attention to the inconvenience of the hooded fire. In addition to the danger of overheating the back corners, there was the danger of damaging the hood in rotating the billet, as well as the inconvenience of disturbing the billet with constant stoking.

This led to the development of the forge/kiln which we use today (see diagram). Here the heating is direct but separate, the kiln being well above the firebox. This arrangement heats more evenly, keeps the stoking separate and the peep-windows provide a 360 degree view.

Steve Brunst: Container (copper, shakudo, shibuichi, kuromi-do) raised from 55 layers.

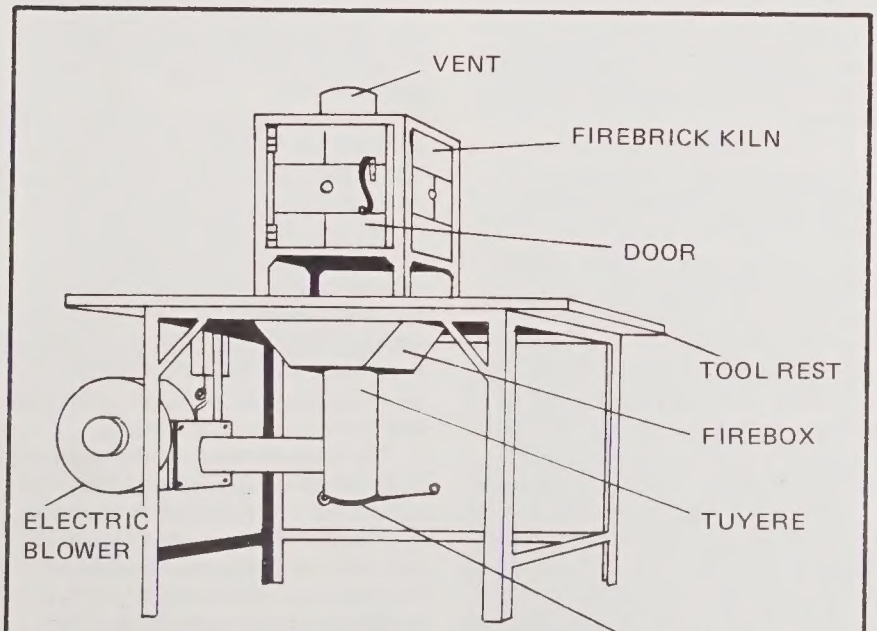


FIGURE A: THE MOKUME FORGE/KILN
–Height (total) 53", width 42", depth 28"
–Height (kiln) 22", width 16", depth 14" (outside)
–265 CFM Dayton Blower

THE PROCESS: BILLET TO SHEET (Pattern Development)—The pattern development techniques for mokume are similar to those used on Damascus steel, namely material removal, surface distortion, edge forging, and twisting. The philosophy is much the same as well, the object being the creation of a delicate surface pattern requiring an involvement on the part of the viewer deeper than mere attention to form.

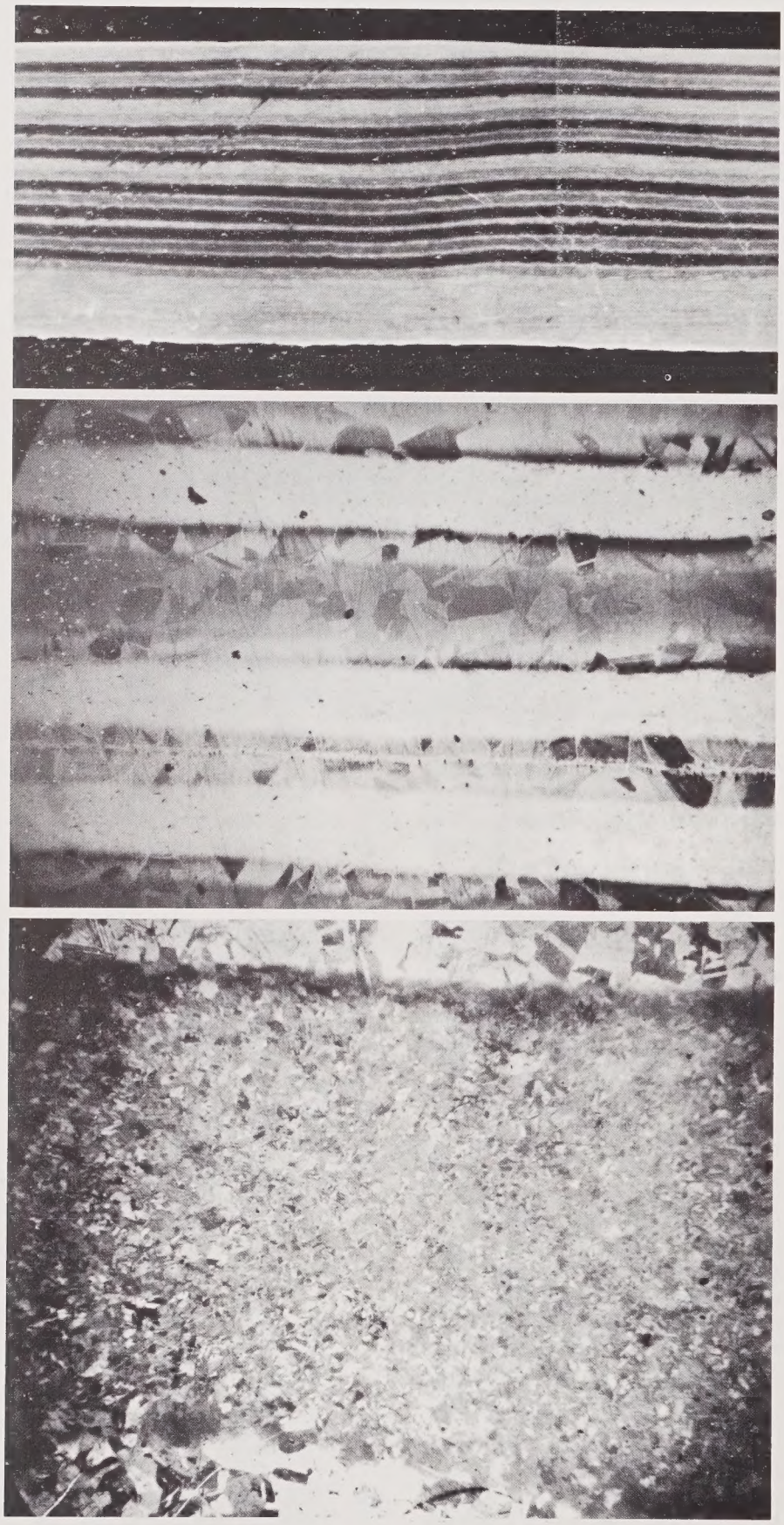
A mokume pattern produces a "visual sensation combining that of a resolvable abstract design with that of pure texture" (no. 19). The woodgrain effect of the pattern is a form of artificial identity with nature, and its look of a topographic map provides an artificial depth, an "interplay of dimensionalities" that is at once subtle and absorbing.

The mechanical means of achieving these patterns are somewhat less subtle. Development by material removal is usually done with a hammer and chisel. By carving the billet with a chisel, great control can be exercised at the expense of hours of work. The Pijanowskis suggest the use of a two-flute ball end milling attachment in a vertical mill to produce a cut like the hatsuri-tagane, the traditional chisel (no. 20). This tool can also be used in the drill press to some extent, drilling more even designs than a drill bit.

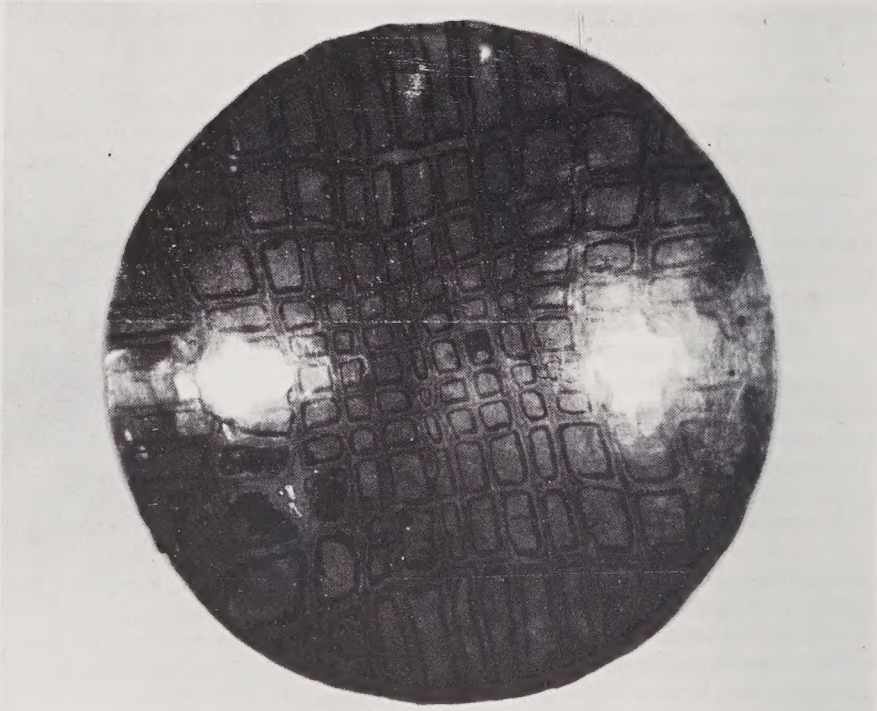
Experimentation has also been successful with turning concentric

19. Sectioned Textures in the Decorative Arts; Smith.
20. Lamination of Non-Ferrous Metals by Diffusion; Pijanowski.

FIGURE B: Photo-micrographs of the metallic grain structure characterizing a diffusion bond. Note the actual growth of crystals across the weld boundary. (photos courtesy Brookhaven National Laboratories.)



Steve Brunst: grid pattern mokume disk.



rings of varying depth on a machine lathe.

The surface distortion methods consist largely of dapping patterns into the billet from the back after forging and rolling it to a suitable thickness. These methods produce much softer, more rounded patterns when the resulting surface bumps are filed flat.

A Damascus twist pattern was also found successful, producing a subtle rope-like pattern when the billet is forged and ground flat.

The most unusual design experiment involved making mokume from mokume. Here, end slices were cut from an unforged billet and stacked with the laminates turned in different directions. This composite billet was bonded, forged and turned on a lathe resulting in an abstract pattern with a linearity unlike traditional mokume.

Before starting the pattern development, it is a good idea to cut off the edges of the billet. This will discourage stress risers from the uneven joints in the later forging process, and it affords a chance to check the bond before investing time in the pattern.

The pattern cuts should be smooth and rounded; deep, narrow cuts will close in with forging and do not use the stratification to its best advantage in any case.

If fine lines are desired, they can be developed in multiple pattern development stages. This method is to go back and recut parts of the pattern after forging when a narrow cut can be made without so much chance of forging it shut.

The finished product should have the same workability as copper sheet. The copper alloys used have the same malleability and, if no zinc or tin alloy is used, the same tenacity. If bonded properly, it will handle the same as copper; it will raise, forge and draw well with no fear of delamination, and can be annealed frequently without problems. Richard Mawdsley has succeeded in drawing mokume into tubing with no difficulty.

The manufacture of mokume sheet is no longer a technical problem. The artist's real effort should be invested in aesthetic development through an examination of the relationship between pattern and form. There is a tendency, after all this time and effort, to think of the material itself as "art". This is probably the reason for so many boring mokume-gane pieces and such a tendency should be watched carefully.

PATINA—During the workshop with the Pijanowskis we learned of Rokusho, the patina which lends such a rich variation of color to mokume. A sample was analyzed by chemists at both Purdue and SIU and the resulting reconstruction was workable but not entirely satisfactory.

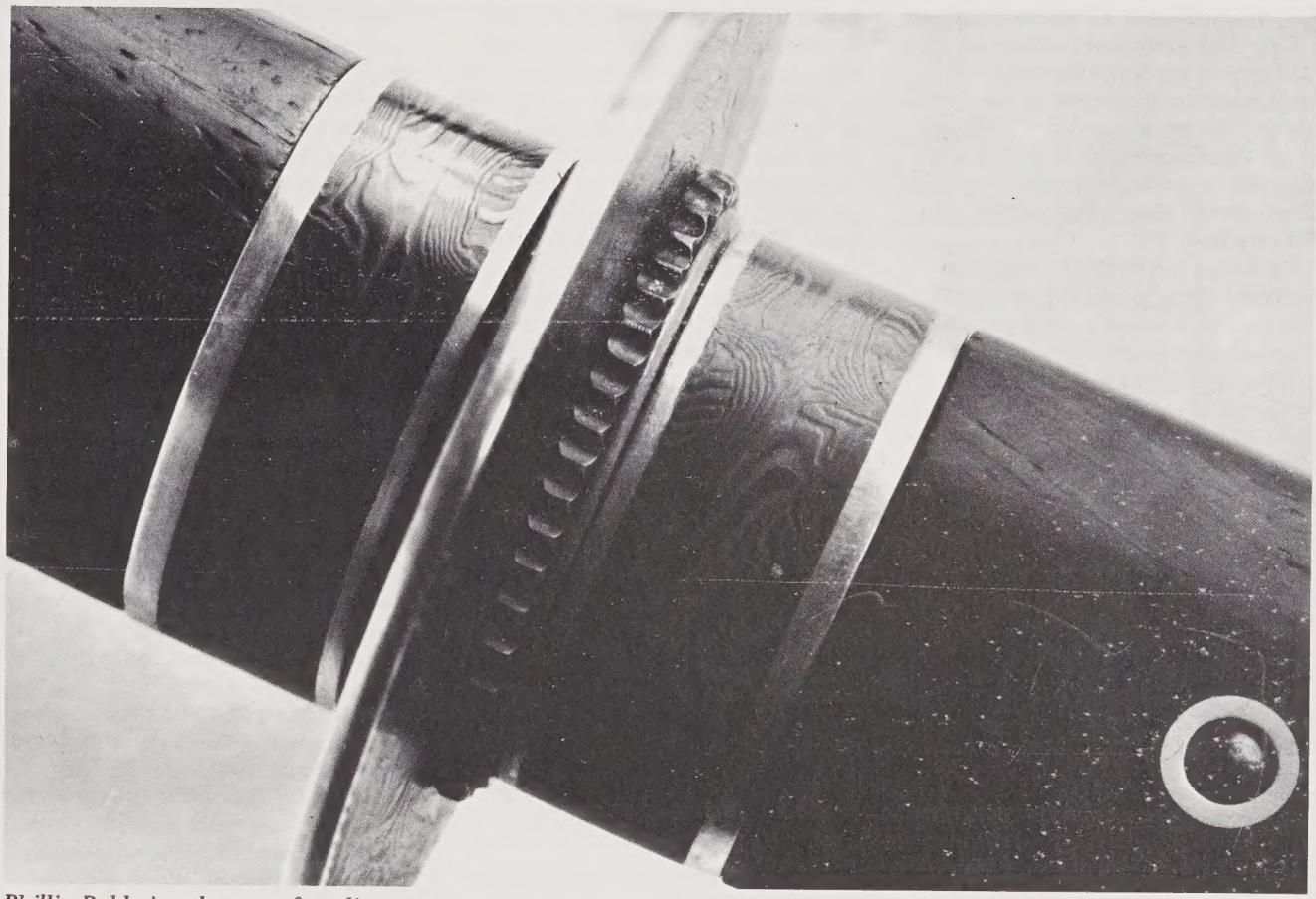
Research into Chinese and Japanese patinas turned up repeatedly mention of vinegar of plums and verdigris as main constituents (no. 21). Eventually we were able to translate the active ingredient in verdigris as cupric acetate and we had a formula going.

Phil Baldwin discovered a mention of the importance of salt in Robinson's "Art of the Japanese Sword" under the "care and cleaning of shakudo sword guards" (no. 22). Experimentation yielded a recipe that gives colors close to traditional models: 4 dwt (6 grams) cupric acetate; 1 dwt (1.5 gr.) copper sulphate; 1 dwt (1.5 gr.) uniodized table salt; 1 litre distilled water.

Although the color quality was very good, it was being marred by spotty coverage until Baldwin happened on an answer to the problem. In the slightly acidic Rokusho, introduction of a copper bar in the solution with the mokume achieved consistently good results by a galvanic response. The nature of the action is still unsure, but the results proved reliable.

In retrospect, it seems probable that the ancient smiths avoided the problem, boiling their patinas in a copper pot instead of a pyrex one.

The patina procedure is fairly simple. Texts indicate boiling the piece first in lye prepared by lixiviating wood ashes (no. 23), but we found a light nitric etch works well



Phillip Baldwin: closeup of sterling-copper mokume sword furniture (pattern developed by twisting and splitting a cross-sectioned billet; etched in 25% nitric and colored in our Rokusho).

also, and the Pijanowskis recommend cleaning in potassium cyanide (no. 24).

Before coloring, the piece should be cleaned with pumice to remove surface oxides and oils to improve the evenness of the patina. If the piece is buffed, take care to remove all traces of wax or oil.

Boil the piece in the Rokusho until the desired colors are achieved. This takes about 15 minutes in our recipe. The colors can be varied according to the amount of salt used; copper, for instance, can be colored from almost a purple to a leathery orange-brown.

The finished piece should be washed thoroughly and coated with wax by heating the piece and applying the wax by hand. This not only protects the color of the patina, but it imparts a soft shine to the work even if it was only given a pumice finish before coloring.

The pattern can be dramatically heightened by the use of an electro-etch before, or instead of a patina. This would give actual relief to the surface of the work and serve to preserve the pattern on a piece of jewelry exposed to wear and tear where the patina is likely to wear off. It can also serve to lend some life to an otherwise uninspired pattern.

This concluded our research into mokume-gane. We feel our work has culminated in a process by which an artist, with some experience, can manufacture mokume sheet in quantity without a great deal of trouble, freeing him to use mokume-gane as he would any precious metal.

21. Art of the Japanese Sword; Robinson; p. 94; Mixed Metals; Hirons; p. 274.
22. Art of the Japanese Sword; Robinson; pp. 94-95.
23. Science and Civilization in China; Needham; pp. 250-255; Art of the Japanese Sword; Robinson; p. 95; Metal and Metalworking in Old Japan; Gowland.
24. Lamination of Non-Ferrous Metals by Diffusion; Pijanowski.

INTRODUCTION TO GRANULATION—Our success at mastering mokume in the forge led us to investigate another ancient metal joining technique: granulation. The two processes seemed related not only by the type of technology which fostered them, but by their metallurgical principles as well.

Whereas the diffusion bond for mokume is the migration of crystalline structure across a weld boundary, granulation employs the actual fusion of the surfaces to be joined. Fusion, as it applies to granulation, can be described as the use of a metal or metallic oxide to create an alloy with the parent metal at the contact point of the surfaces being joined. Fusion occurs at the melting point of the alloy so that a minimum application of heat is necessary.

An eutectic is an alloy of two or more metals combined in a ratio achieving the lowest possible melting point in the system, and having the property of melting immediately into a liquid phase. Eutectics are ideal alloys for granulation, but not all the alloys used are eutectics. An alloy for granulation should be able to melt at a relatively low temperature and diffuse rapidly into the parent metal.

BACKGROUND—Granulation can be defined as localized fusion welding, using the on-site formation of an alloy instead of intense localized heat as in arc welding. Davidson (no. 1) illustrates the desirability of localized fusion over autogenous welding or sweating, where the whole surface is fused (no. 2), and over soldering, where there is no true molecular bond. The true granulation process, she felt, was a type of brazing most closely related to Littledale's colloid hard soldering.

Our first clear understanding of the process came from Littledale's patent papers (no. 3) and a transcription of one of his lectures on the subject (no. 4). Here he pointed out the drawbacks of hard soldering and explained the copper-silver and copper-gold eutectic systems. His process was to put his work together with a dilute solution of copper salt (cupric hydrate) and "Seccotine", a commercial hide glue. Under heat, the hydrate converts to a copper oxide and the glue begins to carbonize. The oxygen in the oxide then combines with the carbon and pure copper is reduced from the oxide around 890 degrees C. The resulting streak of copper in the joint, at that temperature, unites with the parent metal and "alloys" the joint closed.

Our earlier readings had suggested a possible connection between copper residues and the solderless joining of silver and gold. Recipes from the Mappae Clavicula, a medieval document, include gold solders made from copper oxides (no. 5), and Benvenuto Cellini tells of soldering on a charcoal bed with verdigris and borax (no. 6). Theophilus, in his treatise, gives a formula for gold solder from copper oxide and salt that will allow assembling a chalice in the forge without conventional solder (no. 7), and Pliny (no. 8) relates that "gold is dug out of the earth and in proximity to it, gold solder." Davidson translates this to mean verdigris and malachite, which are basically copper acetate and copper carbonate (no. 9).

Clearly ancient granulation formulas depended upon a eutectic alloy from copper and conditions that encourage its formation. Littledale stated that a reducing atmosphere, though not essential, improved the joints in his experiments. We were inclined to agree after our work with mokume. We began our testing with a long reducing flame from a gas-air torch and eventually built a compressed air-fed charcoal brazier for the studio (no. 10).

THE PROCESS—The actual routine of granulation is very simple, from preparing the granules to firing, and only practice makes a master.

The granules are made by the familiar method of placing wire clippings or paillons into charcoal in a crucible and melting them into spheres. Our method differs only in that the paillons are packed in wet charcoal paste and the crucible is fired in the forge. The crucible is raised to a white heat on the outside and held there for 15 minutes, then air cooled. The granules are then sorted or sifted according to size.

For the purpose of doing innumerable tests during our research, the method of torching the paillons was used to create small quantities of granules quickly. The paillons were melted on a charcoal block and allowed to roll off into water as soon as surface tension pulled them into spheres. This produces slightly elliptical granules.

Selection of a chemical will be discussed later, but generally a formula with a low firing temperature, rapid diffusability and clear visual fusion indicator is desired. The cement for our formulas was hide glue from Sears.

Place the granules or filligree with a wet watercolor brush using the surface tension of the solution to hold the design together. Use only enough solution to hold the granules in place and surround the joint. Dry the piece thoroughly.

Fire in a muffle, brazier or reduction flame; the flame was found to be the most expedient for testing. Usually, the stages that occur are these: first the glue carbonizes and the metal frosts. Then, as the piece approaches a red heat, the granules appear dark while the filletting of carbon around them is a bright red. When the solution oxidizes and combines with the carbon, the alloy is formed and the joint flushes somewhat like a solder joint. A rapid heat is essential as the carbon seems to gradually dissipate if heated for a long time.

On silver the bond appears as a mercury-like flash and a surface tension change. On gold the surface at the joint becomes liquid and crawls. The appearance of a long seam is that of a solder seam: the flash flows along it and the joint is sealed.

1. Greek Gold: Hoffman & Davidson; p. 45.
2. Greek and Roman Jewelry; Higgins; o. 36.
3. Improvements in Hard Soldering Mixtures; Littledale (Patent Specification No. 415, 181).
4. A New Process of Hard Soldering; Littledale
5. Mappae Clavicula; trans. Hawthorn & Smith.
6. Treatises of Benvenuto Cellini; Cellini; p. 46.
7. On Divers Arts; Theophilus; trans. Hawthorn & Smith.
8. via Hoffman
9. Greek Gold; Hoffman & Davidson; p. 47.
10. Research team comprised of the authors.

Early granulation test piece: 5/8" disc and grains of fine silver granulated with Antimony 03.

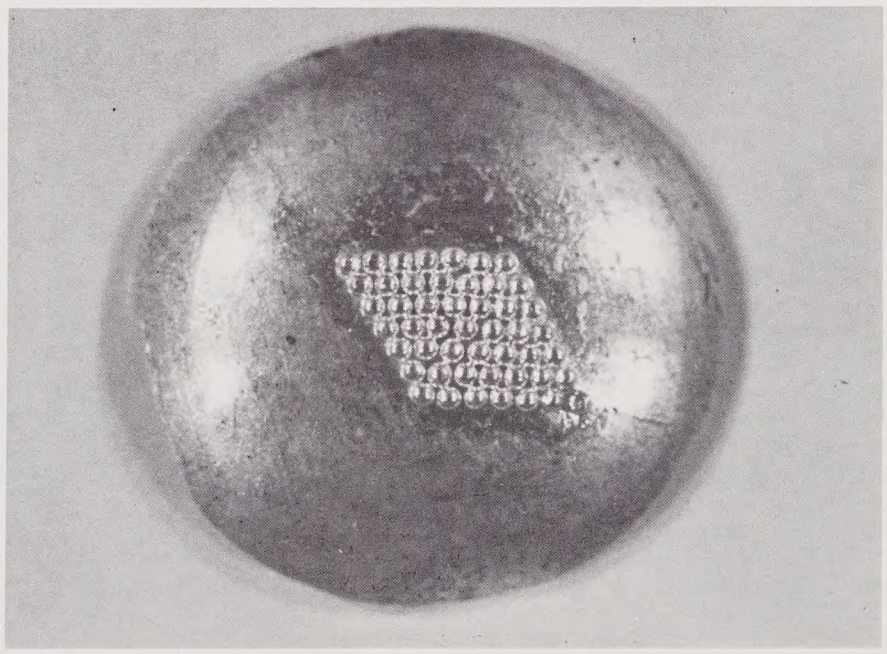


FIGURE C: Phase Diagrams Demonstrating The Characteristics Of Copper, Silver, Gold & Arsenic Under Various Alloy And Temperature Conditions (diagrams from Butts, Allison; Copper, The Science and Technology of the Metal, Its Alloys and Compounds; Reinhold Publishing Corp., New York 1954)

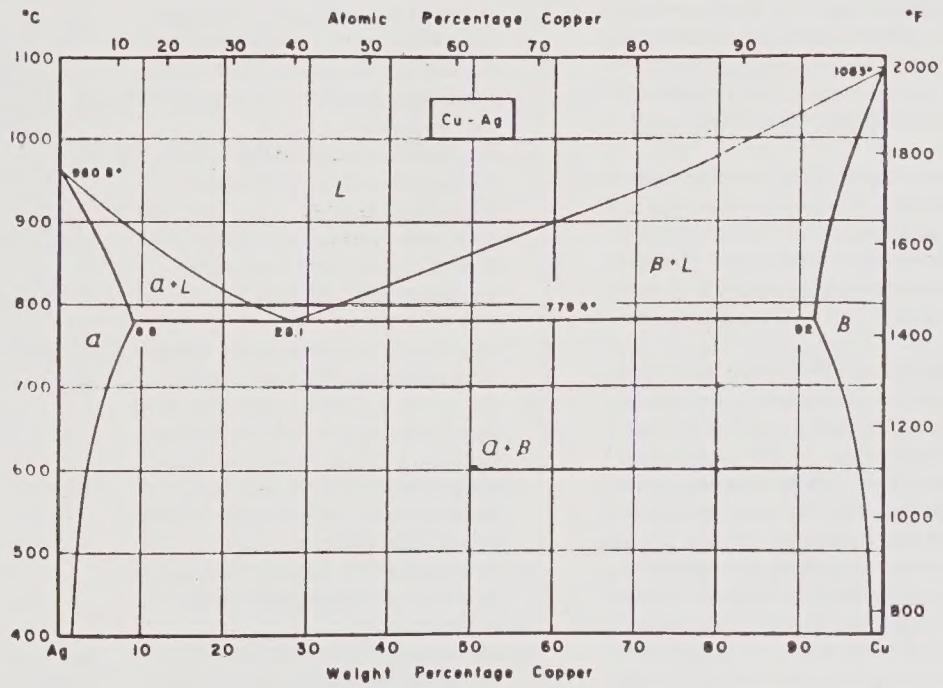


FIGURE 22-1. Diagram of the copper-silver system.

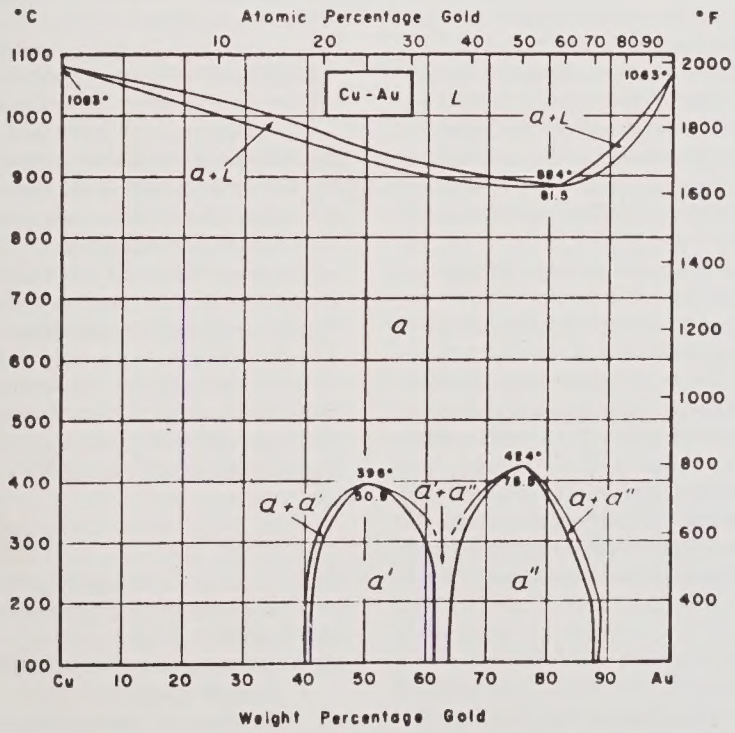


FIGURE 22-5. Diagram of the copper-gold system.

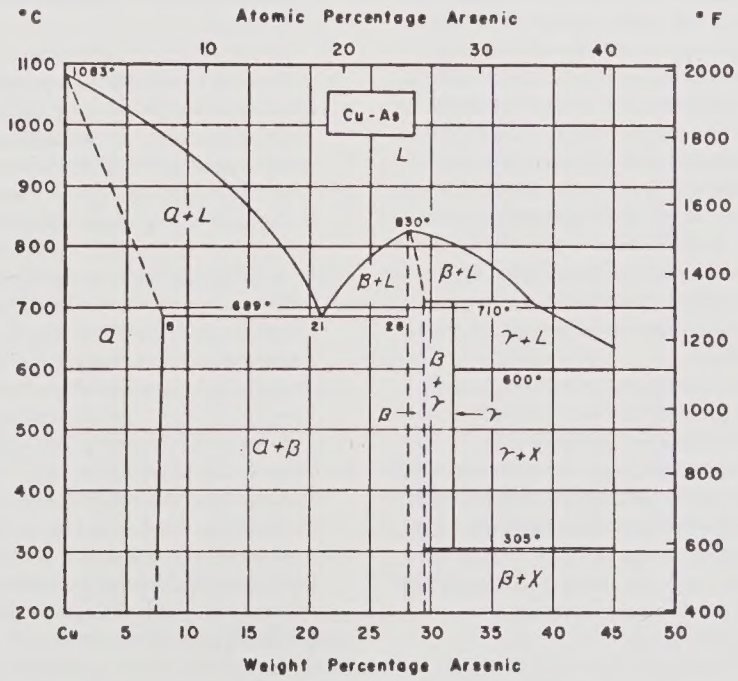


FIGURE 22-4. Diagram of the copper-arsenic system.

The appearance after firing on silver is a soft, frosted ground, shiny granules and very light fillets. Ideally, the granules should fuse only at their tangent points and appear absolutely spherical. Gold should appear very shiny and burnished both on the ground and granules, with very light fillets.

Over filletting is generally a result of overheating, though too strong a solution will also overfillet, causing pits on the surface of the piece. Too thin a solution greatly increases the firing temperature.

CHEMICAL EXPERIMENTATION— Using the principle and theory as we understood it, experimentation began on fine silver. It was understood that not all the alloys created would be eutectics, but the overriding concerns in the experiments were still low fusing point and rapid diffusion.

Beginning with Littledale's formulas and working through all of our sources, almost every formula was found to work to some extent. The most workable formulas were bracketted in dilution, generally from 30/1 to 110/1, but the least promising were abandoned after wide bracketting. The criteria for a "good" formula were good readability at the fusion point, clean surfaces without reticulation or pitting, and acceptable bond strength with small fillets. The formulas were mixed by combining the proper ratio of chemicals with a pre-mixed solution of glue and water, 3/1. Flux was added to the chemical when dry, generally at one part in four. Some of the chemicals, such as acetate, needed to be mixed into a paste before adding the glue solution so that they would go into suspension.

The chemicals listed here are all good formulas for one reason or another; some are excellent in all respects and are highly recommended. A fairly wide variety of results were achieved with each chemical through differences in application and torch manipulation, so these characteristics should be viewed as averages.

On fine silver:

1. Antimony Trioxide (Littledale) with borax glass flux 3/1 is the best overall granulation formula for fine silver. Bracketting best at 30/1, it gave good readability, very strong joints and light, regular fillets. Antimony gave unquestionably the best overall appearance with bright, shiny grains on a clean, frosted ground. Its fusing temperature was the highest of the best formulas.
2. Cu Chloride (Littledale) was recommended by John Marshall. It bracketted best at 110/1 and had very easy readability. Chloride gives a strong joint with clean, frosted grains and frosted ground; an excellent formula for strong, light fillets, fusing slightly lower than antimony 0_3 and acetate.
3. Cu Acetate (Cellini) was the third best in the group. Unlike Cellini, we found better results without using borax flux. It gave easy readability at 110/1, with a good bond, light fillets and clean, frosted appearance. Acetate was not as strong or as clean as chloride or antimony 0_3.
4. Cu Hydrate (Littledale) at 30/1 had good readability at fusion temperature and left a clean surface with shiny granules and good fillets. It did not, however, stay in suspension well and, contrary to Littledale's observations, did not seem to bubble less than the other formulas.
5. Cu Chloride-Zinc Hydrate-Tin Dioxide 50/30/20 (a variation on Littledale's "easy running" formula) using chloride instead of hydrate gave good fillets with good readability at 30/1, but bond strength and surface appearance were not as good as antimony 0_3.
6. Cu Chloride-Antimony 0_3 50/50 (Littledale variation) is an excellent formula at 30/1 giving good readability, excellent fillet structure and bright surfaces. It is not as controllable as antimony 0_3 alone: fillets build very rapidly and it is not as easily read. It fires lower than the chloride-zinc-tin formula. This formula at 80/20 left stronger, heavier fillets with the same general appearance.

Zinc Oxide and Tin Dioxide (Littledale) both gave an inconsistent fillet structure and a dull appearance. They were both abandoned due to comparatively weak bond strength.

Cu Oxide (Littledale and the Mappae) and Cu Carbonate (Hoffman) had good readability and strong joint, but left a badly pitted surface.

Copper plating the granules and applying with dilute glue gave a strong bond, but with almost no control. Fillet growth was extremely rapid, resulting in poor visual appearance.

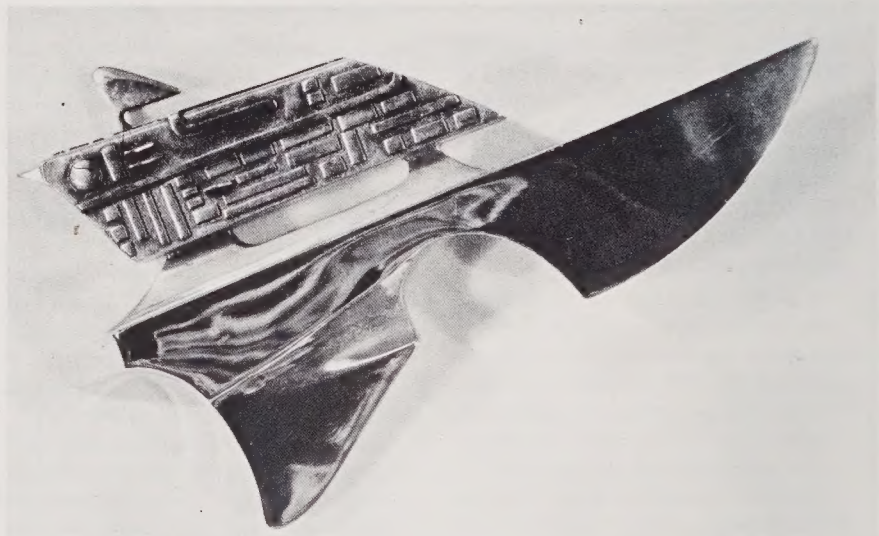
Results on most formulas improved slightly with the addition of borax glass as a flux, a suggestion by Ware (no. 11) in dealing with granulation on sterling. For a brief comparison of the best six formulas, see the comparison chart (Fig. D).

Experimentation using Ware's formulas (no. 12) on sterling was unsatisfactory, giving a poor bond with poor appearance and limited readability; in short, fusion took place very close to the melting point of sterling, leading to distortion, reticulation and total surface fusion.

Unable to reproduce Ware's results with either his formula or our own, we turned to oxidation hardening silver or Spring Silver Alloy No. 15065 (no. 13). This alloy of silver (99.65%), magnesium (.2%) and nickel (.15%) has the advantage of handling very much like fine silver while having, when heat treated, the hardness of hard-rolled sterling (no. 14) and the tensile strength of mild steel (no. 15). Every chemical formula used on oxidation hardening silver gave results which equal those on fine silver.

In addition, we found that the granulation process annealed the alloy to some extent, requiring a subsequent heat treatment in an oxidizing atmosphere for hardening.

We began work on gold using our own alloy of green gold at the suggestion of an article on granulation by Kulicke and Stark (no. 16). This bias was corroborated by the knowledge that almost all of the ancient granulated pieces are of "native gold", that is gold alloyed with up to 5% silver (no. 17).



William Ard: granulation experiment "Rocket Fetish", 3"x2" in sterling and fine silver, granulated pattern with Antimony 0_3.

11. Metal Fusion and Granulation; Ware
12. antimony 0_3 (50%), silver oxide (20%), borax (30%).
13. Oxidation Hardening Silver; Lechtzin (Goldsmiths Journal).
14. ibid.
15. Metallurgy of Non-Ferrous Metals; Dennis.
16. Workshop: Granulation; Kulicke & Stark (Craft Horizons).
17. Greek Gold; Hoffman & Davidson; p. 22.

	Relative Temperature at Fusion	Readability	Filletting	Strength	Appearance
ANTIMONY 0_3 30/1	High	Very Easy	Excellent	Excellent	Excellent
CHLORIDE-ANTIMONY 80/20	High	Easy	Excellent	Excellent	Excellent
CU CHLORIDE 110/1	Low	Very Easy	Very Good	Very Strong	Good
CU ACETATE 110/1	Medium	Good	Good	Good	Good
CU HYDRATE 30/1	Medium	Good	Good	Fair	Very Good
CHLORIDE-ZINC-TIN 30/1	Very High	Good	Good	Good	Fair

FIGURE D: Comparison chart of best formulas on silver in order of apparent reliability.

Experimentation yielded several formulas, including copper plating, which worked very well on 22½k, 16k and 14k green gold. It is expected that granulation could be done on the whole spectrum of gold to silver alloys using one or another of the formulas.

The best of the green gold formulas follow:

1. Silver Nitrate 20/1 was the best formula for 22½k green gold, but failed to work on the lower karat alloys. It gave a strong bond with excellent fillets and a bright, burnished appearance. The fusion flash was easily readable.
2. Antimony 0_3 with flux, unlike silver nitrate worked only on the lower karat golds, giving a good, strong bond and excellent surface quality. Readability was not as clear as with chloride or copper plating; fusion temperature was also higher.
3. Cu Chloride 20/1 appeared to be the most reliable chemical for green gold and fused at the lowest temperature. Fusion read as a bright, liquid "wink" leaving excellent fillets and a strong bond, as well as an excellent visual appearance.
4. Cu Hydrate 30/1 also gave a strong bond with excellent surface characteristics, but fused at a much higher temperature and was more difficult to read.
5. Copper plating and glue 5/1, with or without flux, fired slightly lower than chloride and was not as easily read, but gave excellent results in both strength and appearance. The granules were plated by pickling in an iron pan with a few grains of copper sulphate. Only a light coating was necessary; a copper residue was left on the surface after firing if the plating was too heavy.

Acetate, Zinc Hydrate, Silver Oxide and Copper Hydroxide were also experimented with and dropped due to inferior results. Cu Chloride-Zinc-Tin and Cu Chloride-Antimony 0_3 were also used with some excellent results, but the results were inconsistent due to difficult readability.

Experimentation with commercial yellow gold ran the same course. With 18k gold the lowest firing formulas and the easiest to read were the experiments with copper plated granules and glue 5/1, with or without flux. In both cases there was an obvious fusing "wink" and the joint was strong with light filletting and an excellent appearance after pickling. The use of flux notably reduced the firing temperature and kept the surface cleaner.

Silver Nitrate 20/1, Antimony 0_3 10/1 and Cu Chloride 10/1 all achieved excellent results with good readability. Each chemical produced a slightly finer fillet structure than either plating process.

Finally, 18 karat gold was granulated to itself using only dilute glue and flux. Using the copper in the alloy itself to form the bond, this produced an excellent fillet structure, strong joint and clean surface, but fired much higher than all the other methods. An attempt was made to eliminate the glue as well, but the lack of carbon pushed the fusion temperature into the sweating range.

Our experimentation with 14 karat yellow gold yielded results as dismal as that on the sterling. The comparatively low gold content made the metal unstable and none of the formulas fused well before the melting point was reached. Further experiments with other 14 karat alloys and plating processes are indicated before the alloy can be successfully granulated as Conrad Brown suggests (no. 18).

Testing in bond strength was conducted on fine silver and oxidation hardening silver to determine the value of localized fusion welding in the construction of hollow forms. The top eight chemical formulas for silver were tested against hard solder for filletting, strength and finish.

Each chemical was used to fuse a ½"x1/8" 22 guage wall to a base plate of the same metal. The test pieces were then twisted and bent to destroy the bond.

Most of the chemicals had extraordinary bond strength, the test pieces being distorted beyond recognition before failure. Unquestionably, the toughest joint was from the chloride and antimony 0_3 80/20, with very heavy fillets. Close behind were antimony 0_3 alone and chloride-antimony 0_3 50/50, which fired much cleaner with very light filletting.

The only unsatisfactory formulas of the best eight were Cu Hydrate and Chloride-Zinc-Tin, possibly through consistent underfiring. These, though fairly strong, were not as tough as the hard solder.

The drawbacks of fusion welding for silver construction may outweigh the benefits. Careful fitting is absolutely necessary as slight gaps or warpage will not fill in as with solder. However, the piece can be reheated to fusion temperature repeatedly and, without re-application of the solution, the joint will remain firm. This could be of great advantage in a complicated construction.

CONCLUSION—What began as a search in earnest to discover the mysterious process of Etruria actually turned up a great deal of written information. And, as Littledale states, we still haven't found the right way, the only way of working in granulation.

Though we are confident of the formulas listed here, we are also confident that further bracketting and experimentation could lead to success on the less hopeful formulas. We can only stress the value of practical experience. In the words of Biringuccio's Pirotechnia (no. 19) "try everything, to vary the proportions and the means, until the best way is found."

We must admit to a change of purpose in mid-project. What began with consciously innovative experimentation in the mokume process, gradually became the semi-scientific evaluation of published information on granulation with the intent to produce a comprehensive guide for studio application.

Research and experimentation into granulation will continue, however, at Southern Illinois University. A grant has been applied for to subsidize further research and we have begun to experiment with other procedures and other kinds of metallic alloys.

18. Gold Granulation; Brown (Craft Horizons).

19. Mappae Clavicula; trans. Hawthorn & Smith.

Concerning our return to the forge, we used the torch for most of our experiments. A compressed air charcoal brazier was designed and built for use in the studio, but we cannot recommend it over the torch. It does provide a better reduction environment which produced a slow-motion fusion effect, at least with antimony 0_3, and it gives a more mature fillet structure by heating from underneath. But ranked against constant stoking and fire maintenance it seems a small return.

What we suggest is an exercise in comparative technologies, a consideration of the old methods if not a return to them. The Etruscan metalsmith may have reached for his charcoal brazier simply because he didn't have a torch at his bench, but there was something about the technology that created the brazier that made it easy for him to baffle us for two thousand years. The Japanese, too, had no choice about his tools, but they gave him an edge over us in his work.

As modern metalsmiths, we need to change our approach. Nothing in our art need be closed to us if we are willing to use our technology along with that of the past and not instead of it.

Marvin Jensen: Bank (copper, shakudo, shibuichi, kuromi-do) 4½"

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ELECTROPLATING ON TITANIUM AND TANTALUM SUBSTRATES

A strongly adherent silver electroplate can be deposited on titanium with the assistance of an intermediate layer of molybdenum. This electroplated silver serves as the brazing metal in subsequent joining of the titanium metal to a second material. Such a process is also effective if the initial substrate is tantalum rather than titanium.

The titanium surface is first electrolytically degreased. Rinsing of the surface is followed by 30 second of etching with a 15% hydrogen fluoride (HF) solution at room temperature.

A porous molybdenum film is electrolytically deposited o n the cleaned surface from a solution which contains 10 grams liter of ammonium molybdate ($(NH_4)_2Mo0_4$) and 20 grams of ammonium nitrate (NH_4NO_3). Plating of the molybdenum requires a current density of 2 to 3 amperes per square decimeter (about 19 to 28 amperes per square foot) for 30 seconds.

The surface is then washed and scrubbed with a wire brush to prepare the partially oxidized molybdenum film for a subsequent cathodic reduction. This reduction, which activates the molybdenum surface, is achieved by applying a current density of about 8 amperes per square decimeter (about 74 amperes per square foot) for 3 minutes while the titanium piece is immersed in a solution containing 50 grams per liter of sodium gluconate ($CH_2OH(CHOH)_4CO_2Na$) and 50 grams per liter of sodium hydroxide (NaOH). A final rinsing makes the surface ready for the application of silver.

An initial silver strike from a cyanide bath is followed by rinsing. Silver is then electroplated for 50 minutes at a current density of 1 ampere per square decimeter (about 9 amperes per square foot). The cyanide bath used for this plating contains 40 grams per liter of silver cyanide (AgCN); 40 grams per liter of potassium cyanide (KCN); 100 grams per liter of potassium nitract (KNO_3); and 40 grams per liter of potassium carbonate (K_2CO_3). The 30 micron (1.2 mil) thick silver plate thus obtained adheres strongly and is well suited for subsequent brazing.

TIN-CONTAINING BRAZES

The primary element in almost all brazes is silver. Among the brazing properties enhanced by the presence of silver are ductility, strength, corrosion resistance, and a low melting temperature. Most brazes also contain copper and either tin, cadmium, or zinc. Tin is increasingly being preferred to cadmium because of cadmium's high toxicity. Legislation in some places now prohibits the use of brazes containing cadmium if a health hazard might be present.

A wide variety of cadmium-free silver-tin brazes have thus been developed. With respect to composition, the simplest of these brazes are the ternary alloys which contain silver, copper, and tin. A corrosion resistant cadmiumfree ternary braze containing 60% silver, 30% copper, and 10% tin, for instance, is quite useful in the food processing industry. HOT is the name given to a braze of this composition by The Sheffield Smelting Co., Royds Mills, Windsor St., Sheffield S4 7WD, England, while Degussa, Weissfrauenstrasse 9, Postfach 2644, D-6000 Frankfurt 1, Federal Republic of Germany, manufactures an alloy of the same composition under the trade name Degussa 6009. These two very similar brazes are particularly desirable when spacing tolerances cannot be well controlled, since they each possess a wide melting temperature range of 600 Degrees C to 720 C (1112 F to 1328 F).

Quaternary alloys, containing silver, copper, zinc and tin, are increasingly being used in place of traditionally popular quaternary alloys of silver, copper, zinc, and cadmium. Jewelry, cutlery, and holloware can be fabricated with quaternary braze known as Degussa 6002. This alloys contains 60% silver, 23% copper, 14.5 % zinc, and 2.5% tin.

Quaternary alloys such as made by Engelhard Industries, 70 Wood Ave. S, Metro Park Plaze, Iselin, NJ 08830, Silvaloy 25T braze, have lower silver concentrations and can be used for brazing joints in refrigeration equipment. Silvaloy 25T, which has a melting range of 685 degrees C to 760 C (1265 F to 1440 F) consists of only 25% silver together with 40% copper, 33% zinc, and 2% tin.

Some brazes developed for special purposes are more complex and are alloys of five or more elements. An alloy designated M12MNT, for instance, is manufactured by The Sheffield Smelting Co. for the brazing of tungsten carbide tools used in rock drilling equipment. This relatively new braze possesses excellent strength even at very high temperatures. In addition to a 42% silver content this cadmium-free braze includes copper, zinc, manganese, nickel, and tin.

PUBLICATIONS MADE WITH SILVER

(courtesy of The Silver Institute Letter, No. 8, Sept. 1978)

A rapidly increasing number of publications are printed by lithographic processes, also called "photo offset." The system uses a silver halide compound on film, paper or other materials and the technology is based on photography. Here's how it works.

The text of a magazine, for example, was reproduced in coded perforations on a tape. The tape went though a machine which translated the code and triggered a strobe light which projected the images of letters and words on paper coated with silver halide. This paper went through developing and fixing solutions to produce a positive image of the original text. The paper photographs were re-photographed, on silver halide film this time, to get a negative image which was then exposed to a cylindrical plate coated with photopolymer, a light sensitive material, resulting in a positive image on the cylinder. The cylinder received and transferred ink to a press which printed the magazine page.

Ordinarily, the silver-halide film comes out as a negative. Then, when it is applied to the plate, the clear areas let light go through and form hardened photopolymer there to receive and transfer ink, while the dark areas prevent light from going through, and leave the photopolymer in condition to be washed off.

In some cases the silver-halide film is developed to give a positive image, and in this case a photopolymer is used on the plate which will soften and be removed by light passing through the clear areas, and which will remain hard to receive and transfer ink at the dark areas.

More than 500 daily newspapers, numberless newsletters, magazines and other printed matter today use lithography, an industry growing in the U.S. at the rate of 10% to 15% annually. Approximately 560 million square feet of silver halide film is going into offset printing in 1978, using over 7 million troy ounces of pure silver, in the U.S. alone.

One troy ounce of silver produces about 78 square feet of lithographic film and that's enough to cover approximately 34 average sized newspaper pages. With this silver halide film selling at about U.S. $0.40 per square foot, it's a $225 million film business.

FREE-CUTTING NICKEL-COPPER ALLOY

Nickel-copper alloys are resistant to corrosion, withstanding the attack of sea water and even of dilute sulphuric acid. They are widely used in the form of castings for equipment which must withstand these conditions. However, they have poor machinability, and they are not as hard as would often be desirable.

Now it has been discovered that the inclusion of a little silver results in improvement in these respects. Whereas a standard alloy containing 70% nickel and 30% copper is not suitable for machining, and has a Vickers hardness of 220, a newly developed alloy containing 70% nickel, 29% copper and 1% silver is easily machinable and has an increased Vickers hardness, of 260. (In Japanese)

Katsuyoshi Wakamoto, Mitsubishi Electric Corp., Maru-nouchi Chiyoda-ku, Tokyo 100, Japan, *Japanese Kokai Patent* 77 114, 520, September 26, 1977.

PEOPLE

TECHNICAL PAPER AUTHORS' EXPOSE ON WORK PHILOSOPHIES

WILLIAM ARD

There is a certain amount of fantasy involved in both designing and viewing my work, whether the imagery is as obvious as a space ship desk toy or a more abstract composition of curves and planes for jewelry. Most often the complex curves and steamlined forms of my pieces are at least vaguely reminiscent of the aerospace industry. These elements of fantasy and complexity are very important to me from the standpoint of viewer/wearer involvement.

I feel a piece must cry out to be examined more closely, to be handled or worn. Jewelry must evoke a desire to try it on, to see where it takes you in terms of defining your own outlook and personality. And above all I feel it must be wearable. If a piece is not meant to be worn, why suggest that it's jewelry at all?

To the end of wearability I've turned almost exclusively to hollow construction. This not only keeps my jewelry light and comfortable, it affords me the pleasure of solving difficult fabrication challenges. After all, if your work isn't fun to do, maybe you're in the wrong business.

PHILLIP BALDWIN

I have been working steel since the age of fourteen. It is my life, and nothing will stop me from growing and learning.

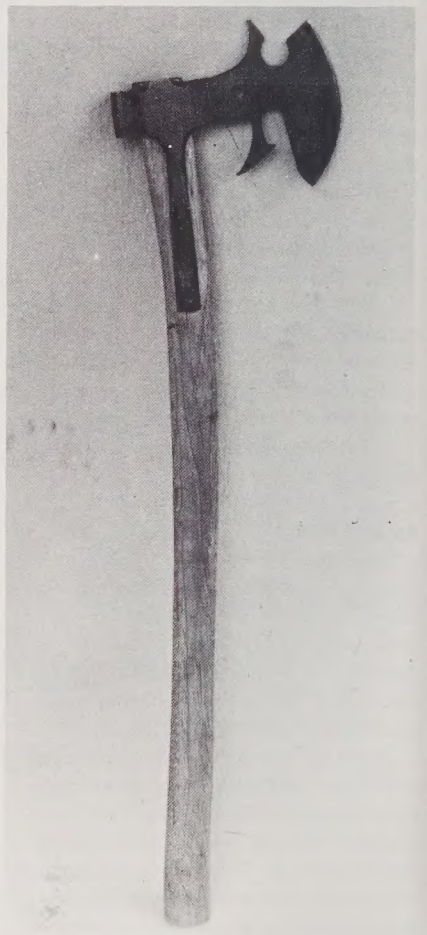
STEVEN BRUNST

During the past two years my focus has been mainly on small, wearable jewelry. In order to achieve a rich visual image with a precious quality, I have alloyed various shades of green, yellow, and red golds, often using multiple colors and shades within the same piece to enhance its volume and to play with reflected light. My images are mostly organic in nature and, because of their three-dimensional forms and the nature of the materials I use, each piece must be constructed.

Although the visual make-up of my work is of primary importance, its ability to be comfortably worn is of major consideration. Having in the past worked on a large scale with little consideration for the wearer, I have now evolved to a minute scale with the same aesthetic considerations given to larger pieces and more concern for the harmony that should exist between the wearer and piece.

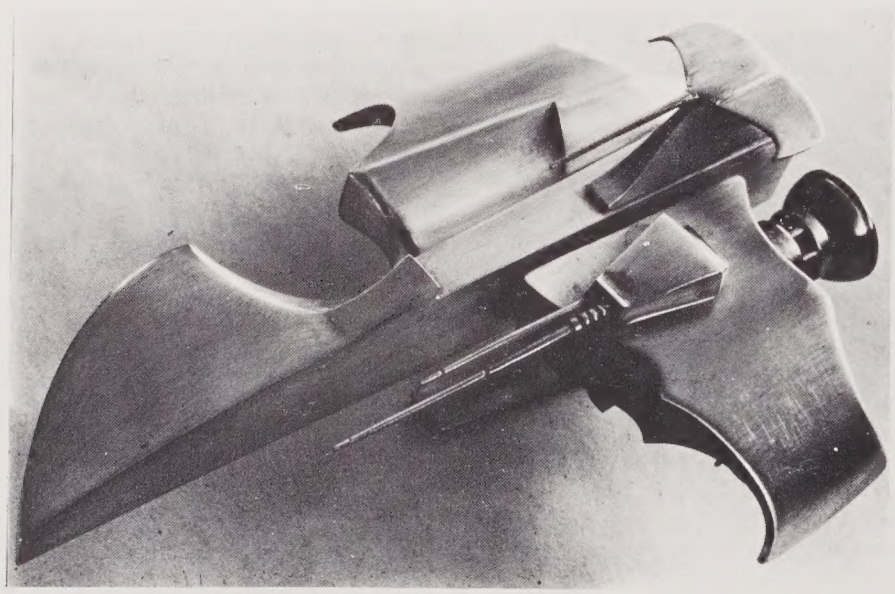
MARVIN JENSEN

My work here at SIU—Carbondale is divided into three areas: Folding knives, mokume hólloware, and sculptural forms (fantasy rocking-horses). Conceptually they all deal with humor, irony and paradox. I feel that my work best reflects a sound sense of form and sensitivity. The rocking horse series, perhaps the most expressive of my work, comes from the ten years of commercial custom motorcycle work and my involvement with homebuilt airplanes before entering the M.F.A. program at Southern. Steel tubing framework combined with the Dynel/ Epoxy composite construction typical of contemporary homebuilt aircraft construction offers me almost unlimited possibilities as far as size, shape, weight, strength, and ease of construction are concerned. In these pieces the soft sensual forms, finished with slick high-depth lacquers and polyurethanes, combined with quasi-functionality, all add to the expression of mystery, irony, paradox, and fantasy. The parallels between the motorcycle as a symbol of the illusion of freedom, phallic symbolism and power, and the fantasies of a child on a rocking horse, make the horse an excellent vehicle.



Phillip Baldwin, "Going and Coming," axe

Steve Brunst, Organic Construction, green, red, yellow-gold, silver, 2-7/8" l

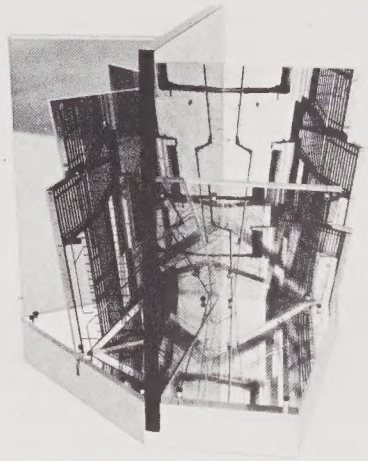


William Ard, "Executive Space Toy," sterling, 4" l

RANDY JONES

Functionality is new to me. As an object maker, I was concerned with paying homage to the forms ingrained in me as the son of a machinist. Until Southern, I was making machines that did nothing and were mostly aluminum in construction — not practical to handle. Resolving this problem was a matter of selecting a function and designing a piece that contained my love for the machine and retained that functionality. Such functionality need not be obvious although the choice of stainless steel as the primary material leaves little doubt that this piece is meant to be used.

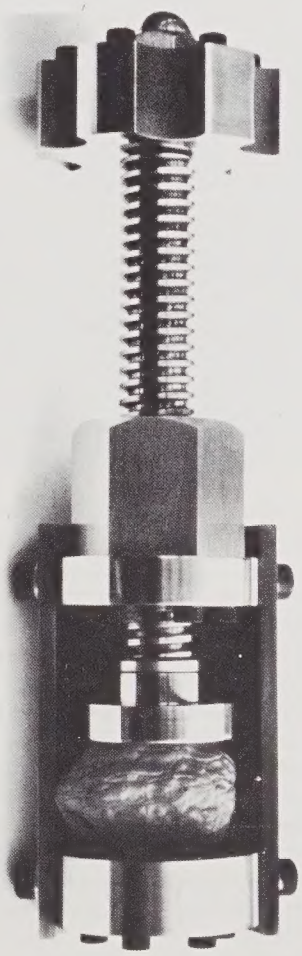
Randy Jones,.Nutcracker, Stainless steel, brass, 7½" h



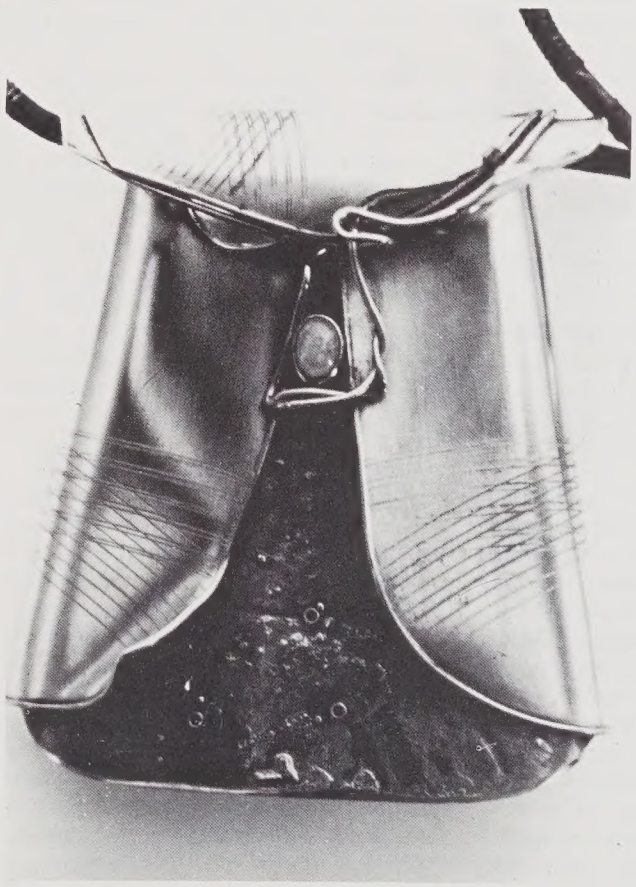
Lori Van Houten, "Photo Construction No. 6," 9" h

JANIS NATHAN

The visual stimulation for my metalwork continues to be derived from the tension of the organic and the geometric. Presently this is being transformed into the theme of the landscape to create wearable, intimate metalwork. My enjoyment of intimate objects sways me to produce precious and delicate pieces containing fine, subtle details which have limited viewing distances. In order to communicate my ideas, I have employed the use of reticulation as well as the fusion of precious metals while adding details including scribed lines. My investigations are leading me to incorporate the use of silk threads and paper. My evolution feels slow but at the same time exciting.



Marvin Jensen, rocking horse "In Search of a Good Time," steel, Dynel/Epoxy Composite Lacquers, Polyurethanes, 60" h

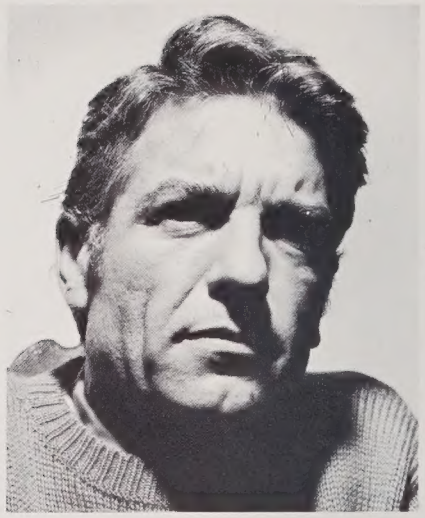


Janis Nathan, "Coin Purse," sterling, 14k gold, opal, silk, 2½" h

LORI VAN HOUTEN

My work deals with illusion and allusion, shadows and light, timelessness and silence. These qualities and an absence of color make my miniature environments separate from reality.

AUTOBIOGRAPHY OF BRUNO MARTINAZZI
GOLDSMITH AND SCULPTOR
PROFESSOR AT THE "ACADEMIA DI BELLE ARTI DI TORINO"
ITALY



Bruno Martinazzi

Since the editor of the Goldsmiths Journal asked me to write my autobiography I have been perplexed: The pen and the written word are not usual instruments of communication for me. Indeed I have chosen other means for expression more suitable to my nature. But I will do my best!

I was born in Ewinn in 1923. Italy is not only the country of colours and sun — Torino is an austere, grey city — the City of Fiat — the first industrial and working city of Italy. But Torino is lively, culturally and artistically. Life for artists is not easy. It requires a constant engagement and great deal of work to succeed. In Torino everybody works and produces; nobody can permit himself idleness and unproductive fantasy.

I was born in the gloomy city from a family of military and man of letters on my mother's side, and an ex-industrialist of Vermouth on my father's side. My great-grandfather was producing Vermouth and Aranciata Martinazzi, once very famous in all the country. But the generation of my father lost all the money and I never enjoyed the prosperity of the Martinazzi family.

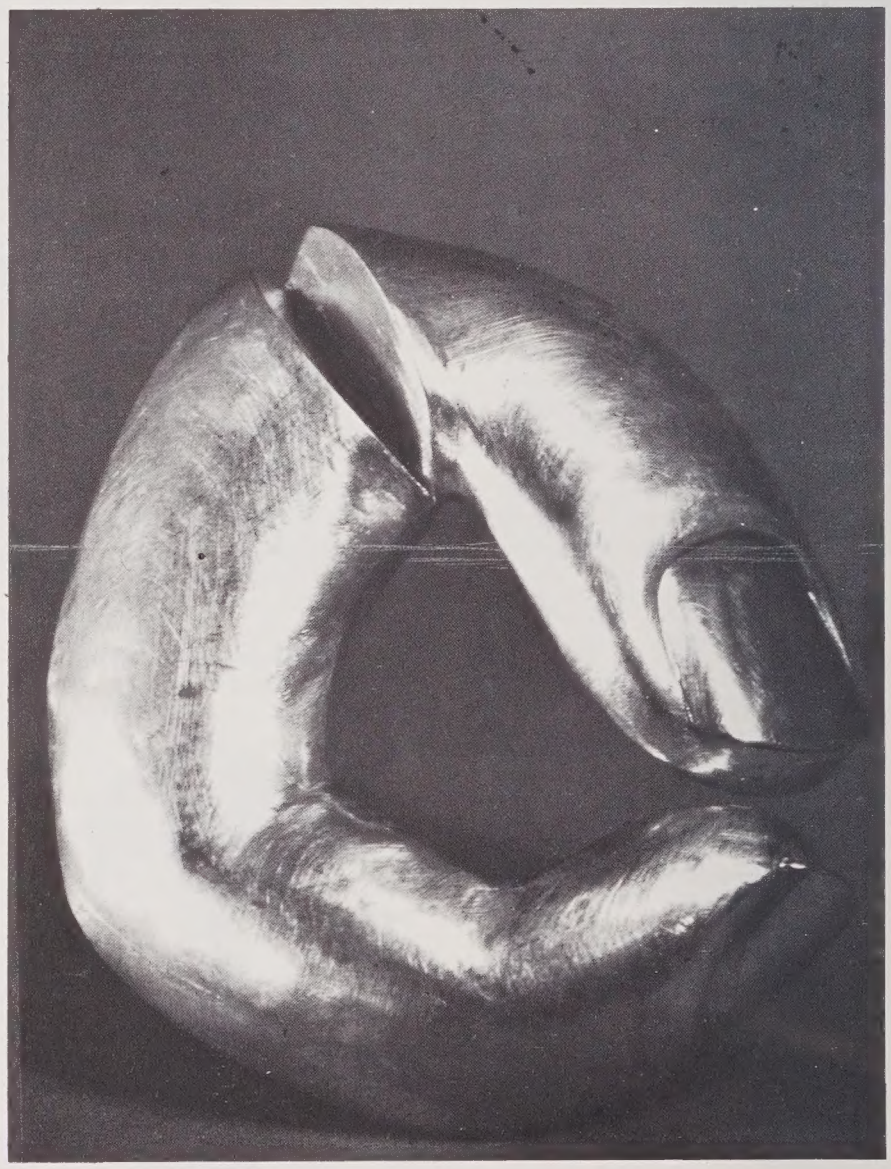
"I was always considered quite different from the rest of the family.."

My father died when I was little and I was brought up by my mother and her family, receiving a traditional education: Classic studies, university graduation and PhD. Since a little boy I was always considered quite different from the rest of the family because I was expressing myself through concrete doings — making things with my hands instead of with words. Being the family 'mechanic' versus 'intellectual,' it was decided I should study chemical science at the university — thus the beginning of very long studies, culminating in my PhD in pure chemistry in 1947. The University studies did not passionate me at all and I finished them because of a sense of duty toward the family, particularly my mother, a widow with three children who had worked very hard to permit us to study.

In the middle of my university work, we had the experience of war. These were hard years when I learned to meditate on the absurdity of violence and inhumanity. I was captured in Alba from the Germans at the end of the war and liberated in April 1945. The memory of those years is very painful for me and I carry a sentiment of great adversion for the war and the rhetoric of patriotism that goes with all the military actions.

At the end of the war I finished my last university degree and began work as a chemical analysist for the textile industry, responsible for the colour section where the material was dyed. But my chief interest was not chemistry. Besides the severe studies of science, I was secretly cultivating all kinds of interest for music, painting and the arts in general. During the evenings, to keep my moral up, I was frequenting the free Academic of Arts in Turin and the goldsmiths school Gizardi. After five years as a discromatic chemical dyer during the day and a secret artist during the night, I offered my resignation, much to the surprise of the Director who could not believe I was leaving such a good job to become a free goldsmith.

I took one year more to study and look into methods and techniques of goldsmithing and then went to Florence. In those years my relationship of love with the land of Toscauo began — a feeling that still remains. So I went to Toscauo and then to Rome and studied the antique techniques of Etruscani and Roman goldsmiths. I became passionate in the technique of repousse, which is still my main specialization.



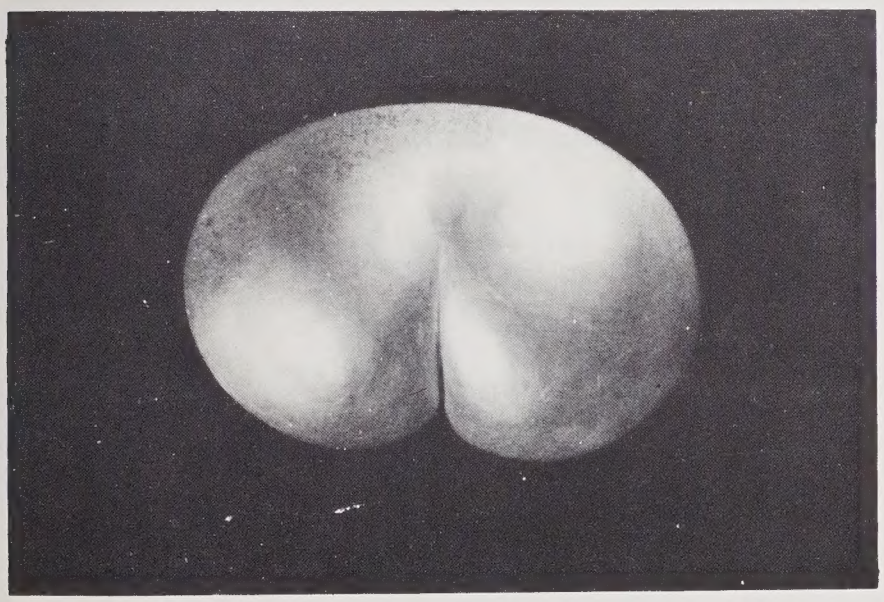
Bruno Martinazzi, "Homo Sapiens" brooch, 20k & 18k gold, cm 5,6 –photo by Pucci Giardina

But who helped me the most were a couple of old craftsmen from Turin, the brothers Mussa. I went to work with them as an apprentice in a tiny workshop where we could hardly move. But I learned from them the secrets of the trade, the astuteness, the pleasure of work well done and of accurate execution. I was working on repousse of copper, silver, bronze and studying the patient technique of enamel. My first exhibition was on enamels and it was an unexpected success that gave me courage to go on and try new things.

I had many orders of sacred objects from architects and religious orders and was making items such as candelabrums, chalices, madonnas, crosses, etc. As I have never been a believer, this seemed to me quite contradictory, so I soon gave this up and dedicated myself to work on research closer to my philosophy and way of life.

"My first exhibition was on enamels and it was an unexpected success that gave me courage to go on and try new things."

Bruno Martinazzi, "Mouth" brooch, 20k & 18k gold, cm 3,4xcm4 1968
–photo by Pucci Giardina



Bruno Martinazzi, "Back-side" brooch, 20k gold, cm 3 x cm 2,2, 1968
–photo by Pucci Giardina

The first sculptures are of 1950 - wax castings. I think all men are holy — all men who work and toil. So my statues in bronze and copper had the halo — a halo of suffering — and many thorns on the body, quite tormented and painful. During that period all my attention was directed to the presentation of the human form — a man who lives and dies, very attached to the heart and not all transcendent like the madonnas and saints I was making before.

In the early 1960's the man with the halo became 'group' then 'mass,' but always painful, strong and patient on his sufferings. By this time, I was participating in several exhibitions in Italy and all over the world. The Worshipful Company of Goldsmiths, London, bought my jewelry for their collection. The economical problem was no longer pressing and I was able to give more space for my research.

A friend architect asked me to work with him on a monument to the Resistance and the subject interested me very much. I wanted to give my interpretations of that period: The fear of men — fear of our own and others' suffering and the human dimension of the drama of war. We began and the project won the concourse for the monument to the Resistence of the City of Aostra, although the monument was never realized.

In 1965 I decided to stop my contact with art galleries, as I needed time to study and work. I returned to the University of Turin and studied psychological science. I also accepted a teaching contract at the art school there. I was interested in contact with the young people — the late sixties was a stimulating time — the Berkeley Revolt, the peace movement — an alternative to violence seemed to spring from them and it was a great hope.

In the period from '67 on, my work goes in for a big change. The jewelry becomes more severe, less decorative; the sculptures begin with large stones. I enjoy working with hard material that offers resistence and is opposed to change.

From the representation of 'groups' I passed on to 'symbols' and presented reality in human body forms. The first series was the MOUTH - symbol of society's waste and greed that eventually devours itself. Next came the FIST, representing encounters between forces, not necessarily of violence. After that, the HAND — hand as creative, an instrument of knowledge and invention, meant to establish a relationship with others. And last, the MEASUREMENT — suggesting a means of understanding the universe of which man is a part.

During the past years, my interest has been in the capacity of man to produce in a creative way. The final product not being of concern, but rather the function of producing and the process of creating. I searched into the means of work.

My interest now is in finding and defining creative work, in terms of different situations, but with the end purpose being the development and socialization of the human person. Fundamental is the group dimension — working together on something of interest to everybody. Creative work especially lends itself to collaboration not often found in other situations.

So, the objective of my actual research is to continue my work in a dimension both aesthetical and social. The process of artistic production is now the central point of my interest: A moment of creativity, of development and growth of all social, intellectual, affective, and moral possibilities.

AUTOBIOGRAPHY

by Pamela Hassler

My life as a student, teacher, businesswoman and, most of all, artist, has given me a variety of opportunities and experiences that have been exciting and invaluable.

I entered college in 1966 at the University of Colorado as a modern dance major. It was there that I studied art history for the first time and found the same kind of excitement of movement in a visual sense that I had formerly only known through music and dance.

In the summer of 1967, I began studies in visual design and drawing at the Memphis Academy of Arts where I stayed until 1971 when I received the B.F.A. degree in metal arts. I have never regretted my training as a fine artist rather than a studio jeweler. The fine arts program is similar to a hot house for delicate plants during their formative stages. It encouraged my creative formation and personal development. My choice of metal and enamel was determined chiefly by the brilliance and permanence of these materials as well as the challenge of working them.

"The summers I spent in Mexico expanded my design concepts through constant stimulation of new people with varying life styles. . ."

In 1972, I began graduate study at the University of Tennessee in Knoxville in metal design. Upon graduation in 1973, I was appointed instructor of metal design and enameling at the same school. I then began summer study and work toward the M.F.A. degree in San Miguel de Allende, Mexico at the Instituto Allende between sessions of teaching at the university in Knoxville.

The summers I spent in Mexico expanded my design concepts through constant stimulation of new people with varying life styles, different landscapes, architecture, dress, etc. Although technical training was limited at the Instituto, the experience was invaluable to me as an artist in terms of visual stimulation since for me technique is a means to an end rather than an end in itself.

I received my M.F.A. degree from the Instituto Allende in 1976 and in 1977 was invited back to teach enameling and lost wax casting for the summer session. That same year I taught an enameling workshop at Peters Valley Craft School in Layton, NJ.

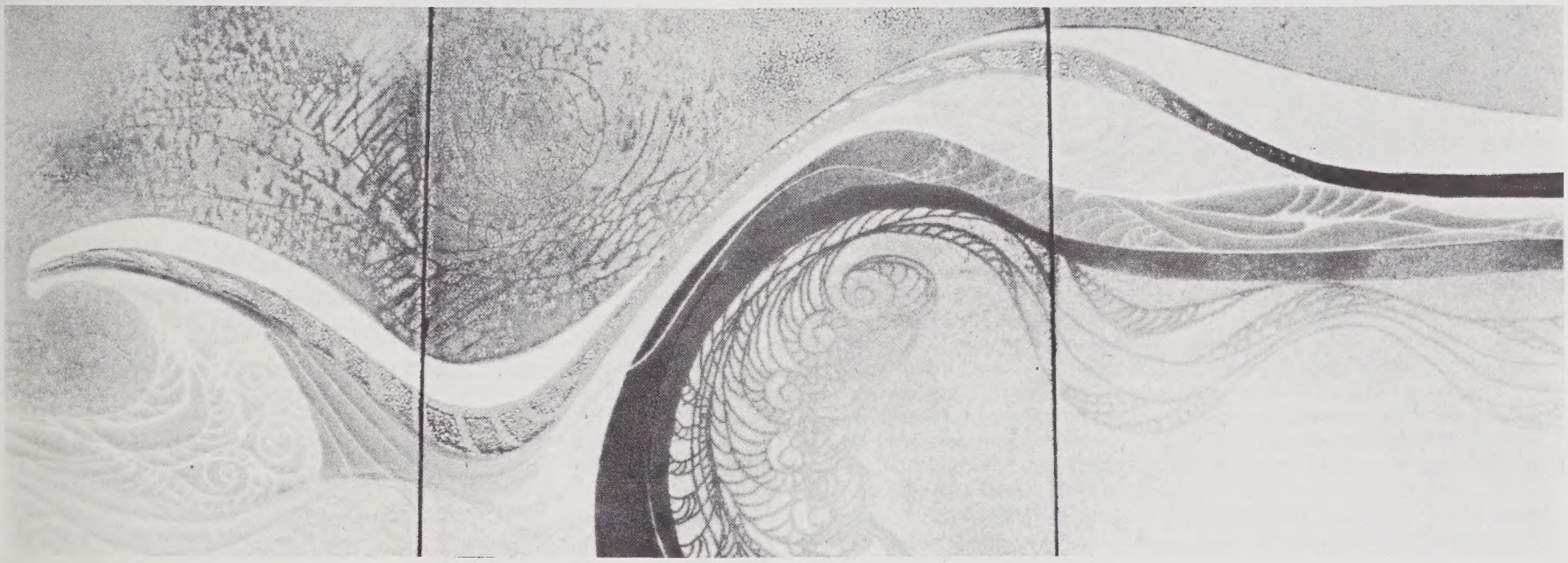
In 1975, my enamel wall piece entitled "Solar Storm" was chosen for the Third International Biennial of Enameled Arts in Limoges, France; and in 1976 my work was shown with other Tennessee artists at the Senate Lounge in Washington, DC, at a reception given by Senator Howard Baker.

My career has been in a state of transition for the past two years. In 1976 the metal design program in which I was instructor was cut from the crafts department at the U. of Tennessee. Rather than accept another teaching position, I decided to move back to my hometown (Memphis) and see if I could make it as a studio craftsman. These two years have had their ups and downs. There were definitely times when I felt I should have remained in teaching. Only in the last six months has business been profitable enough to feel that my decision was the right one. As a businesswoman/artist I have had to learn to adapt my skills and ideas to the buying public, necessitating change in my work priorities. As a teacher my work was geared more for exhibition in competitive shows, and although it was called functional, it was not necessarily saleable. The opinions and remarks I value most now are not those of the jurors of exhibitions, but rather the gallery owners and managers who give me direct feedback on which pieces the public finds particularly irresistible or wearable and why. I don't feel as if I have sacrificed my personal taste, but rather have adapted my creativity so that it can be appreci-

Pamela Hassler

Pamela Hassler, pendant, silver, 24k gold, enamel, 1½" dia.

". . .I studied art history for the first time and found the same kind of excitement of movement in a visual sense that I had formerly only known through music and dance."



ated and used by those members of the public who can afford it.

My work may be seen in the permanent collections of Maryville College, TN; the Tennessee State Museum in Nashville; and the Southern Highland Handicraft Guild in Asheville, NC. I am currently working on a one-woman show of enamels and jewelry for the month of May at Ridgeway Gallery in Oak Ridge, TN.

I still have time to give a few workshops and lectures during the year. Last year I served as a crafts consultant for the Tennessee Arts Commission in which I gave lectures and private consultations for other craftsmen across the state. I will be teaching enameling this summer—June 10-22—at Arrowmont School of Arts & Crafts in Gatlinburg, TN.

I feel that I now have the best of both worlds in that the bulk of my time is spent in my studio doing what I love best for clients and shops who appreciate my work — but I also have opportunities to return to teaching occasionally through workshops and consultations where my studio work is stimulated by the sharing of skills and ideas with other students and teachers.

Pamela Hassler, "Undertow", wall piece, enamel on steel with gold foil, 30" l.

Pamela Hassler, neckpiece, silver, enamel, turquoise & emeralds

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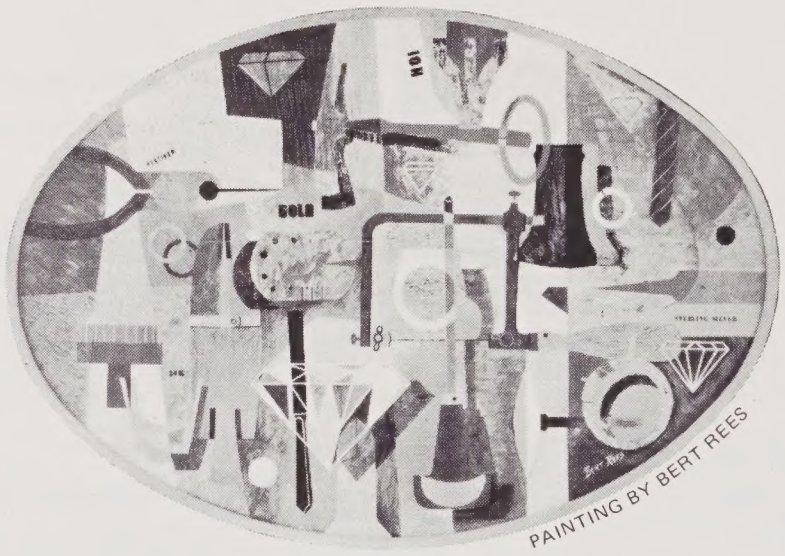

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FEATURE ARTICLES

A SURVEY OF NEW EQUIPMENT FOR JEWELRY AND SILVERWARE PRODUCTION SHOWN AT TRADE FAIRS – 1974-1977 SPECIAL REPORT NO. 33 (PART 2)

by Peter Gainsbury

(courtesy of Worshipful Company of Goldsmiths Technical Advisory Committee, London, England)

PRESSES

Following the lead of Di Maio, who still produce the largest range of hydraulic presses, a number of suppliers exhibit hydraulic presses for jewellers and silversmiths.

The Di Maio now runs to six models from 100 to 800 tonnes, particularly interesting being the 800 tonne model suitable for pressing large flatware, and the general purpose 210 tonne model, UK prices including statutorily required guards being £14,507 and £4,115 respectively.

Other Italian manufacturers who offer hydraulic presses are Boniardi, Dal Trozzo and Emigezzeta, but none of these appear to make any serious attempt to market them in the face of powerful Di Maio competition.

Di Maio presses were also shown at Providence, but here their thunder seems to have been stolen by the British press manufacturer, George H. Alexander. Their Hi-Ton press has been shown regularly by Cassiere and is enjoying excellent sales in the United States priced at $16,800 for 275 ton capacity. This year the Hi-Ton was shown side by side with a range of lower power air-hydraulic presses by another British manufacturer, Jervis Engineering Ltd. These machines range from 2½ to 10 ton capacities, with various frame configurations, offer controllable load and speed, quiet operation, simple tool setting, compact design (the standard 10 ton model is only 14¾ in wide by 16-3/8 in deep) and built in guards. UK prices range from £627 to £1,200.

An American machine dealer, Avnet Machinery, was showing the Hare range of pneumatic presses which already have some penetration into the British jewellery trade as replacements for the outmoded hand fly presses.

In 1975, but not 1977, the well-known British HME knuckle press was also shown at Providence. It seems regrettable that it is necessary to travel to the United States to see these excellent items of British equipment in a jewellery trade show.

JOINING

All the new developments in joining techniques seen in the past few years have originated from the United States, and a major feature of the 1977 Providence Exposition was the wide range of brazing and welding equipment and materials shown.

Very comprehensive ranges of paste brazing alloys and solders for use with automatic dispensers were offered by Krohn, EFD, ASI and Fusion, and dispenders by EFD, Fusion and SM Engineering Company.

The range of electric welding and brazing machines seen at Providence was quite confusing, with five manufacturers offering jewellery size machines for fusion or percussion welding with nibbed findings, conventional spot welding and resistance brazing, some machines being dual functional.

The greatest competition appears to be in the fusion welding field, pioneered by EFD, but now with competition from ASI, FTE and Hansen. The principle of fusion welding has been discussed before, but with this explosion of new equipment at competitive prices, it perhaps merits repetition.

The technique is particularly intended for the welding of small sections of findings, such as ear-wire posts, joints and catches, cufflinks swivels, screw parts, etc. to jewellery components which may have polished, enamelled or plated finishes. All contact can be to the back of the piece leaving face surfaces unmarked. The method can join dissimilar metals and even "difficult" materials such as aluminium and titanium.

The process depends on the use of special findings which are provided with a tiny nib of metal on the surface to be joined. A capacitor storage circuit is used and when the nib contacts the work piece a short circuit vaporises and ionizes the nib, forming a high temperature arc as the capacitors discharge their stored energy. As the finding and the work piece come together the intense localised heat melts both surfaces which are then forged together completing a true weld.

Competition was obviously very strong amongst the makers of these machines at Providence and appeared largely to be concerned with the life of the collets used to hold the findings in the machine. Some makers claim long collet lives while others produce arguments throwing doubt on the validity of these claims.

The prices of the basic welder from the four manufacturers were as follows: EFD 2200 J–$3,125; Hansen AP44–$2,795; FIT XE1100–$2,500; ASI 444–$1,994.

Several of these machines were offered with varying degrees of automation, full automation perhaps tripling the cost of the basic machine.

Spot welding machines at Providence appeared in two forms, the well-tried comprehensive and more or less traditional range by Joyal, and machines by ASI and Hansen based on the mechanical parts of their fusion welders with simplified electrical equipment. Probably more interesting for precious jewellery production is the use of similar machines for resistance brazing, and all three manufacturers offered dual purpose spot welding/brazing machines or purpose-built machines.

An interesting automated version of the Hansen machine, shown by Nemco, was fitted with an EFT solder paste-dispensing system with the dispensing syringe mounted on to a small pneumatic cylinder which automatically advanced it to place the metered quantity of solder accurately in position on the workpiece and then withdrew it to allow the electrodes to close and initiate the brazing cycle. The price of the basic soldering machine was $880 with an additional $550 for the automatic solder dispenser and carrier.

Automatic gas brazing machines were also seen at Providence, ranging from a small turntable model by EFD principally made to exploit their well-known brazing paste dispensers, to a large indexing turntable machine by Fusion Inc. Probably the most interesting was a relatively simple low cost machine by Fusion. This is a two-station sliding table machine with pneumatic operation of the slide. Brazing paste is applied manually to the joint area via a dispenser suspended over the central loading station, or brazing alloy preforms could be used. There is a heating point at each end of the machine fitted with up to four variable-position automatically-timed burners. During the return stroke to the loading/unloading position from the heating position, the work passes under air or water cooling points. The cost of the machine was around $2,000 plus $225 for the Fusion dispenser.

There appeared to be little new in brazing alloy or solder paste dispensers. The three basic competing devices by Fusion, EFD and SM Engineering were priced at $225, $340 and $140 respectively. Most developments of these devices appear to be by EFD in the area of adhesive dispensers and high precision fluid dispensing not applicable to jewellery or silverware production.

For adhesive dispensing, particularly for cyanoacrylate or anaerobic adhesives of low viscosity, where very small quanitites may be required, EFD offer dispensing controllers with a vacuum device to ensure sharp cut-off and have introduced adaptors to enable adhesive manufacturers' plastic squeeze bottles to be directly attached to the dispenser head, eliminating the necessity of transfer of the fluid.

The adhesive manufacturer, Loctite, was exhibiting at Providence, showing another automatic dispenser specifically designed for use with their range of anaerobic and cyanoacrylate adhesives.

In Europe, belt-type bright brazing furnaces have long been available from Swiss, Italian and German sources. The only new European development seen in this area was the Konnle Mini Conveyor Furnace shown by Ferraris at the 1977 Birmingham Spring Fair. This furnace has tunnel dimensions of 50 mm width by 35 mm height and, complete with cracker, is under 2 m in length and half a metre wide. The UK price is £4,660.

In the United States the principal supplier of jewellery-type belt furnaces is SM Engineering Company, and of some interest are their competitively priced new baby models only 8 ft long, complete with ammonia cracker, and tunnel dimensions of 2 in width by 1½ in height. There are two models, a conventional

straight tunnel type at $4,950 and a hump-back model at $5,500.

A range of air ovens for soft soldering was a new development shown by ADI at Providence, designed to carry the work on 12 in x 6 in boards or trays which are carried into the oven on a drawer, the oven operating on either an automatic time cycle or a temperature controller. Four sizes are available to take one, two, four or six boards at a single loading, with basic prices of from $585 to $1,169 with additions for optional accesories such as temperature controllers and interior air circulating fans.

A similar range of furnaces is also available for hard soldering at from $687 to $1,516, but without controlled atmosphere some level of oxidation would have to be accepted. Though not advertised for the purpose, these furnaces would appear to be very suitable for flat enamelling.

METAL FINISHING

At Providence in particular, a wealth of electro-deposition and allied processes were shown. These included all manner of gold and rhodium plating processes, silver plating processes including a cyanide-free silver by Technic Inc. and a wide range of base metal plating processes for costume jewellery applications, including rhodium substitutes by Tivian Laboratories and Smith Precious Metals, generally based on bright tin or indium deposits.

Electro-deposition processes are far less heavily featured at the European fairs. The German firm, Schering, did have an exhibit at Munich in 1974, but this has not appeared since. In 1977, however, Heraeus were exhibiting a range of precious metal electro-deposition processes including those of Philipi who have now been taken over by Heraeus.

Ancillary electrochemical processes, such as antique finishes and precious metal recovery processes, are also well featured at Providence but not in Europe, but on the other hand, electrolytic polishing processes are more frequently seen in Europe, generally associated with specialised items of equipment.

American suppliers tend to show fairly large-scale plating plants including automatic conveyor systems as shown by Greco Brothers. In Europe there is more concentration on smaller scale and bench top plating units. Each of the main Italian and Spanish suppliers offer integrated plating plants of normal jewellery size, whereas with the exception of Heraeus, the German suppliers who exhibit at Munich appear to concentrate on the smaller bench top units, good examples being shown by Reco Dental, Haffner, Karl Fischer, Dr. Weiland, Seltsam and Heraeus themselves.

No new developments in electrolytic polishing processes have become apparent over the past few years. Electrolytic polishing machines are now available from most general and electroplating suppliers, but these are basically only straightforward plating tanks with higher powered rectifiers than those used for deposition applications, and all depend on the normal cyanide high conductivity type of electrolyte.

Turning to mechanical polishing equipment, 1977 at Providence saw a virtual explosion of barrel, vibratory and high "g" polishing equipment, with practically no showing at all of conventional hand polishing lathes.

High "g" or centrifugal burnishing and polishing machines make use of centrifugal forces to achieve dramatic reductions in barrel treatment times; reductions of polishing times by factors of twenty or more are claimed.

The principle of the technique is that small polishing barrels in multiples of two or more are given a planetary motion by being mounted on the periphery of a rotating carrier, while they themselves rotate in the same plane. The centrifugal force generated by the main motion keeps the charge of components and polishing media pressed against the side of the barrels facing outwards at all times, while the individual rotation of the barrels keeps the charge moving over itself. The constant contact of work and medium under high pressure thus achieved gives very efficient working.

Machines are produced with rotations in either the vertical or horizontal plane, the vertical plane machines tending to be of larger capacity with more barrels per unit.

At Providence, small machines of the horizontal type were shown by Dr. Manfrid Dreher who had a new, very compact 3x1½ litre barrel machine, and Advanced Methods and Controls (AMEC) who showed a two barrel model from the wide range of "Harperizer" machines which are well established in general industrial practice.

At Munich, Dreher showed both horizontal and vertical plane machines and another vertical machine by Sonnenberg of Pforzheim was shown by Seltsam. Examples of prices for the two Dreher machines were DM 5,170 for the FT3K and DM 11,220 for the FT4V.

Many different vibratory polishers have been seen at the various fairs, ranging from small stone polishing machines to high capacity general engineering machines, such as the well-known Boulton Sweco range, and a particularly comprehensive range was shown at Valencia by Elga, with 1976 prices ranging from 74,145 Pesetas to 457,000 Pesetas.

Some manufacturers produce special purpose machines of this type of particular jewellery and silverware interest, and a good example is the KV15 burnish vibrator of Dreher, currently priced at DM 3,400. This is a rectangular chamber machine specially designed for the polishing of small components. Polishing times as low as fifteen to thirty minutes are claimed.

Rotating barrel polishers have appeared in even greater profusion than vibratory polishers and outfits have been seen from single small barrels to larger multiple installations with built-in emptying and washing equipment. Once again, Dreher supply a most comprehensive range with barrels from five to forty-five litre capacity in a variety of configurations. For jewellery purposes the Dreher mini tumbler with a five litre hexagonal barrel priced at DM 1,462 is an effective and economical machine.

Analogous to electrolytic polishing is barrel polishing. Once a good standard of mechanical design of the equipment has been achieved, quality of finish obtained is much more dependent on the nature and quality of the polishing media than the actual polishing machine itself. Naturally, convenience in operation and polishing time will be affected by barrel and ancillary design, but polishing quality is much more dependent on the charge make up.

Some manufacturers maintain trial installations where optimum procedures can be worked out for different types of work. It is strongly recommended that anyone contemplating the purchase of substantial barrel or indeed vibratory polishing equipment would be wise to go to a manufacturer who has the experience and capability to carry out trials and determine the most suitable procedure to obtain the results required before any purchasing commitment is made.

Little of note has appeared in conventional rotating mop polishing machines in recent years. In general, polishing motors still operate at the standard 2,850 r.p.m. which is too low for most purposes, and perhaps the deciding factor in purchasing is the nature and efficiency of associated exhaust equipment. All the large Italian and Spanish general suppliers produce neat polishing benches, with built-in exhaust systems, and there appears to be little to choose between them.

An interesting development in this field, however, is the unit produced by Italimpianti, which has electrostatic air cleaning instead of the normal bag filter system. The unit is rather bulkier than normal filter units, but very high efficiency dust extraction is claimed. Units are available with two or four polishing spindles at $2,390 and $3,280 respectively. A very practical device in this field was introduced by Karl Fischer at Munich. Known as the "Dustomat" and priced at DM 845, this is a small self-contained bench top exhaust and filter system which can be added to conventional plain polishing lathes without modification.

Since the reduction in the showing of manufacturing equipment at Basel, very little mechanical polishing equipment for jewellery has been

seen, but no doubt the Swiss Bula Company has continued to develop its machines for this purpose. For silverware manufacturers, however, an interesting range of semi-automatic polishing machines have been shown at Valencia by the Spanish firms of Orni and Leiva.

In 1977 Orni showed a range of electropneumatic devices for automatic polishing of holloware and trays which can be fitted to conventional silver polishing lathes of their own or possibly other manufacture. For example, a two-head polishing lathe fitted with the automatic gear on each head for external polishing of hollow forms was priced at 450,000 Pesetas, and a machine with somewhat similar heads but with the additional facility for internal polishing up to a depth of 120 mm was 600,000 Pesetas. This equipment may appear expensive compared with conventional polishing, but it must be remembered that a single unskilled operator can easily feed four polishing heads on two machines, each one of which can independently operate on different components or different parts of the same component. The capital cost of such a set-up would probably be less than the saving on the wages of three skilled polishers in the first year.

The Leiva equipment was less sophisticated and consisted of the conversion of conventional lathes to semi-automatic linishing or satin finishing. In one configuration, an abrasive belt and backstand was fitted to the polishing spindle and flat work for linishing was carried under the contact wheel on a powered flexible belt. This arrangement appeared to be very suitable for the treatment of flat blanks or enamelled surfaces. On the other spindle of the same lathe a soft abrasive wheel with a sliding jig holder fitted under it provided semi-automatic satin finishing of shallow components. Another machine by Leiva was a large double belt automatic linisher which appeared to be particularly suitable for the prefinishing of flatware and holloware blanks.

A very interesting bench-top automatic polishing/linishing machine was introduced by Clair Manufacturing Co. Inc. at the 1977 Providence Exposition. Designed for polishing or linishing flat or shallow contour parts, this machine has a 12 in x 8 in work table which has both reciprocating and oscillating motion under an 8 in wide buff, "Scotch-Brite" wheel or linishing belt. Optional extras include wet linishing facilities and a vacuum work holder. The work holder seen at Providence was very simple, consisting of a section of the scrap press webbing from the components being treated, simply glued to a plain wood work table which automatically provided a perfect jig. The price of this very compact machine was $6,127.

MISCELLANEOUS

At the fairs one sees many items which do not fall into any of the categories discussed hitherto, but which are of considerable general or specialised interest.

Almost all general suppliers at the fairs show jewellers' benches, generally in standard configurations. Some very sophisticated watchmakers' benches are seen at Basel, and the ultimate in conventional jewellers' benches was the Schlups goldsmiths' table shown by the Swedish firm of Tofaba AB at Copenhagen, costing around £500 in 1976. Even more expensive at well over £1,000 is the complete workshop in a single bench by Boniardi which incorporates casting, plating and polishing equipment and built-in compressor and vacuum pump, all in one unit no larger than a good sized normal jeweller's bench.

Several interesting adjuncts to bench work have been seen. For conserving precious metal sweep Sumes in Spain and Reco in Germany have shown bench pegs with suction take-offs for drawing in filings and dust. Reco also supply neat under-bench dust collectors for this and other applications such as polishing and grinding wheel hoods at various prices around DM 800 to DM 1,000.

Unusual power handpieces were shown by Tredent at Munich which, although electric, were analogous to air-powered units in that the motor was in the handpiece replacing either flexible shaft or air hose with a light cable. The handpieces were light and comfortable to hold and had excellent torque with high speed operation up to 20,000 or 33,000 r.p.m. in two models. Prices with foot switch and bench control unit were DM 1,780 for either model, with replacement motors at DM 360.

Seltsam offered a miniature belt sander for fitting to a normal flexible shaft handpiece which provided a flat finishing area about 250 mm x 1 m in addition to a back-up wheel for contour grinding. This could be fixed in a single clamp or was quite light enough for hand use. The price, however, was high at DM 450.

Coming up the scale a little, Seltsam were also offering a bench top power unit with double power take-off for various applications. A 50 mm belt linisher was available, a flexible shaft drill could be connected or a conventional polishing spindle could be added. The price of the basic two-speed power unit was DM 375, the linisher DM 495, and the flexible shaft and handpiece was DM 185.

Two new types of ring sizers have appeared during the period under review, both of which provide parallel stretching as well as compression. The NE 100 by the German watchmaking tool manufacturer, Elma, has been seen on the stands of several tool suppliers. It is in the form of a combined screw press and puller, which forces the ring, held in a special plastics sleeve, through a tapered steel die for reduction in diameter and similarly stretches rings by fitting a plastics sleeve inside each ring and pressing the sleeve over a tapered mandrel. It is claimed that this size will handle circular section and broad and patterned rings without damage. The UK price is in the region of £250. An additional accessory is available for the sizing of gem-set rings.

The second sizer was designed by the very well-known German ring maker, Christian Bauer, initially for their own use, and offered at the 1976 Copenhagen and Basel Fairs. In this case, stretching is carried out on a horizontal stepped expanding mandrel in contrast to the usual tapered one. Reduction is accomplished by compression via a split plastics sleeve on to a steel sleeve of the required size. Proved in Bauer's own highly efficient factory, the complete unit was DM 1,920 in 1976.

Two other devices to east the work of the hand craftsman were seen at Providence. The first was a simple but ingenious hand bending tool for strip and wire known as the "Duomite" by Mark Eyelet and Stamping Inc. This was a bench mounted tool capable of shaping wire up to 5/16 in diameter and strip to 1 in x 1/8 in and with an adaptor which would form strip up to ¾ in wide in the flat plane. With a special spring loaded handle the device would make non-circular bends around suitable formers. The price of the basic unit was $84, with the edge bending accessory and forming handle costing $29 and $24 respectively.

The second machine was a powered engraving and surface decoration unit which was highly praised by craftsmen trying it out at the exposition. Basically a miniature hand held power hammer, this machine is called the "Gravermeister", made by the GRS Corporation. Unlike conventional mechanical or pneumatic operation. The range of the machine is such that with appropriate tools, it can be used for cutting steel dies, stone setting, florentine finishing and metal and glass engraving. The complete unit with power source and handpiece was priced at $495.

A development in mechanical surface decoration by Di Maio which is remarkable for its basic simplicity is a machine for the texturing of metal beads. This consists of a rectangular box with a rotating file plate in the bottom and an inclined baffle which lifts the beads and allows them to fall on to the plate. Simply by varying the time in the machine, varying textures can be obtained most efficiently on gold and silver balls or beads.

Shot blasting machines are regularly seen at Milan, Valencia and Munich, and a wide choice is available. A new machine of particular interest for decorative appli-

cation was the American Conico Micro sand blast shown by Seltsam which uses hand nozzles to permit local decorative surface blasting with or without masks. The price in Germany of this equipment was DM 4,000 to DM 5,000.

For many years watch band manufacturers have sought automatic saws for cutting brick bracelet tubing. In recent years two or three prototype machines have appeared at Milan and two by FIOA and Boniardi now appear to be established production lines. The FIOA machine priced at 1,550,000 Lire in 1976 cuts two tubes alternately with a 50 mm circular saw. It has micrometer adjustment of cut length between 0.5 mm and 8 mm on tubing up to 7 mm section. The production rate varies between 38 and 116 pieces per minute.

In the FIOA machine the tubing reciprocates against the circular saw. In the Boniardi machine a single tube is held stationary during the cut and the saw moves. This machine also has micrometer setting for cut length and the 1976 price was 2,000,000 Lire.

The Crafford "Link-O-Matic" automatic linking machines have been described in earlier reports and are still available with detail improvements. At Providence in 1977, another linking machine, the "Link-All" was shown by Alviti Tool & Die Inc. This is an all electric machine appearing to work on the same principle as the Crafford machines, but with more limited range and more utility design, and was offered at the relatively low price of $2,210 for a model which handles links of the order of 0.32 mm to 0.50 mm wire diameter, and $2,395 for a model for smaller link sizes. The machine operates only on preformed open links, which are available from the manufacturer.

Steam cleaning has long been a standard feature of American jewellery workshops and though it is an economical and most effective process, it is rarely used in Europe. Perhaps one reason for this has been the non-availability of a European-made jewellery type steamer. This position has now changed with the production of a modern automatic water feed steamer by the German company, NDI Dental. Known at the NDI "Nova Clean" this machine has been shown by Linn Elektronik at Munich. This is a compact machine, measuring only 320 mm x 300 mm x 200 mm, but unlike most small American machines, has continuous automatic filling. The 1977 price was DM 2,800.

Representative of typical American steamers is the range shown by Gesswein at Providence, ranging from a two gallon hand filled model at $419.50 to an automatic feed eight gallon model at $1,440.

Useful general purpose machines for jewellers and silversmiths are the bench mounted metal cutting circular and band saws by Kunzman, shown at Munich and Birmingham, priced at £700 and £1,100 respectively. The band saw is particularly interesting in that, in addition to operating with a conventional table at 90 degrees to the blade, it can be arranged so that the blade runs parallel and just clear of a horizontal table, an arrangement which is very suitable for trimming pressings.

Finally, a few items of interest in relation to lapidary and precious stones. At Munich, the balance manufacturers, Sauter, Sartorius and Mettler, usually exhibit their balances for precious metal and stone weighing. An interesting development in this area was a semi-folding portable single pan diamond balance, of which virtually identical models have been exhibited by both Sauter and Mettler. These balances have a capacity of up to 40 metric carats and give direct readings on a battery illuminated 10 carat scale. Closed, they measure about 275 mm x 113 mm x 175 mm and are supplied with a carrying case. The 1977 UK price of the Sauter was £326.

Unusual items seen at the 1977 Basel were two Japanese ultrasonic drilling machines for stones shown by Siber & Siber. The smaller of these models, USD 50, will drill hard stones with holes from 1.2 mm to 10 mm diameter and, complete with generator, was S.Fr. 2,850. The larger machine USD 150, with a drilling capacity of up to 25 mm diameter, was priced at S.Fr. 9,890.

Gemmological instruments are not normally seen at trade fairs, but in 1976 at Copenhagen, the German firm, Kruss, showed a range of instruments which included two spectroscopes, both utilising cold light via fibre optics, and which to this inexpert observer, appeared to facilitate greatly the viewing of spectra of precious stones. The simpler model for jewellers' use was priced at DM 1,800, while the professional model with many special features and camera adaptor was DM 2,800.

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NAMES AND ADDRESSES OF SUPPLIERS

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* Assembly Systems Inc., 161 Admiral St., Providence, RI 02908, USA
* Avnet Machinery, 311 Roosevelt Ave., Pawtucket, RI 02860, USA
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* Taller Electromecanico Bega, SL, Mosen Ferrer, 21-B, Valencia, Spain
* Benmayor, Cartagena 301, Barcelona 13, Spain
* Carl Benzinger, D 7267 Unterreichenbach, Bahnhofstrasse 7, Postfach 20, West Germany
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* Umberto Boniardi & Figli, Via Valpetrosa 5, Milan, Italy
* William Boulton Ltd., Providence Engineering Works, Burslem, Stoke-on-Trent ST6, 3BO, England
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* Cassiere Machinery Co., 145 Cary St., Providence, RI 02908, USA
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* ERSCEM, 157 Avenue de Stalingrad, 95100 Argenteuil, France
* FASTI di Borga, Via Polisen 26, 10016 Montaldo Dora, Torino, Italy
* FIOA (Forniture Industrie Orafe Aretine) Via Genova 15, Arezzo, Italy
* Karl Fischer, Berlinerstrasse 18, Pforzheim, West Germany
* Fischer Fico & Co. Maschinenbau GmbH, D 7530 Pforzheim, Postfach 548, West Germany
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* FTI (Fusion Technology Inc.), 301 W. Main Street, Chartley, MA 02712, USA
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* Paul H. Gesswein & Co., Inc., 235 Park Avenue S., New York, NY 10003, USA
* Gori & Zucchi S.p.A., Via Fiorentina 550, 52100 Arezzo, Italy
* Greco Brothers Inc., Greco Lane, Providence, RI 02908, USA
* GRS Corp., Box 1157, Boulder, CO 80306, USA

* C. Hafner, D 7530 Pforzheim, Postfach 708, West Germany
* Nemco Hansen, 18 Albion Rd., P.O. Box 10, Manville, RI 02838 USA
* P.J. Hare Ltd., Wrington, Nr. Bristol, England
* Harper Buffing Machine Co., 363 Ellington Rd., E. Hartford, CT 06108
* Heraeus Edelmetalle GmbH, Lameystrasse 17, D 7530 Pforz-Heim, West Germany
* Hispana de Maquinaria S.A., Pallars 85-91, Barcelona 5, Spain
* Hi-Ton, George H. Alexander Machines Ltd., Hall St., Dudley, West Midlands, England
* Cincinnati (Milling Machines) Ltd., HME Division, Kingsbury Rd., Birmingham 24, England
* Inresa, Alfons Schultheiss KG, D 7534 Salmbach bei Pforzheim, West Germany
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* Kerr Mfg. Co., Inc., 28200 Wick Rd., Romulus, MI 48174, USA
* Wolfgang Konnle Apparatebau, D 7534 Pforzheim, Birkenfeld, Industriestrasse 29, West Germany
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* Kunzman GmbH, D 7530 Pforzheim, Antere Au 41-43, West Germany
* KWS Kachele KG, D 7530 Pforzheim, Ostliche 53, West Germany
* Leiva Commercial de Maquinaria, Vara de Quart, Valencia 14, Spain
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* August Sauter KG, D 7470 Ebingen 1, Gartenstrasse 86, Postfach 250, West Germany
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* H. Seltsam & Sohn, Leopoldstrasse 20, D 7530 Pforzheim, West Germany
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* Technic Inc., P.O. Box 965, Providence, RI 02901, USA
* Tivian, 330 Silver Spring St., Providence, RI 02904, USA
* AB Tofaba, Box 153, S 19401 Upplands Vasby, Sweden
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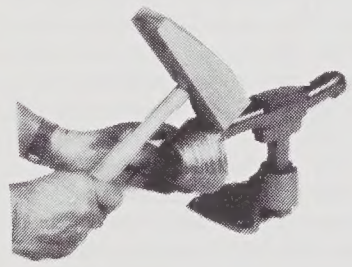

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DIAMONDS ARE FOREVER, THE GEM TRADERS OF WEST 47th STREET MAINTAIN A TIMELESS WORLD

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Just before 9 a.m., a dusty yellow bus pulls up to a corner in midtown Manhattan and lets out a dozen black-coated, bearded Hasidic Jews from Brooklyn. Others, similarly dressed, come pouring out of the subway entrance. Swiftly, the narrow, dirty street begins its daily transformation. Pale hands splay rainbows of gems across velvet cloths in store windows, magically making each an entrance to Ali Baba's cave. This is West 47th Street, a tiny world of its own that handles about half of the diamonds entering the U. S. Here brokers play middleman between American buyers and the supplying De Beers syndicate in London, and the deals amount to more than $2.5 billion worth of rare gems a year.

No one is sure of the exact figure because of the legendary secretiveness of the diamond trade. But business is obviously booming. In the past five years, prices have quintupled, and the working population of the street has more than doubled, reaching about 15,000.

Inevitably, such growth in an area dealing in such a precious commodity is accompanied by friction and occasional sparks of violence. Earlier this month, Martin Paretsky, 71, left the street with $500,000 in diamonds heading for a meeting at the Hilton Hotel. No trace of him has been found. Two days later, Satya Narian Gupta, 27, one of the handful of Indian dealers on the street, left his office with $300,000 worth of stones. Three days later, his body was found bound and strangled in Pennsylvania's Pocono Mountains. There have been no arrests in the case. The well-publicized incidents have made the merchants even more tight-lipped than usual. They fear that any talk with outsiders could lead only to greater vulnerability.

The insularity of West 47th Street stems from the homogeneity of the diamond dealers. The vast majority are Jewish. Until the end of World War II, there were only a couple of diamond shops in the 47th Street area. Then came the influx of survivors from the Nazi Holocaust, many bearing the tattoos of their concentration camps. The newcomers entered a business that had been a specialty of Jews since the Middle Ages, when the trade was one of the few professions that did not come under the purview of a tightly controlled guild. Diamonds were also perfect wares for a persecuted and wandering people who had to carry their means of livelihood with them.

The high value the Hasidim place on personal honor sets the tone for the street, where packets of diamonds worth hundreds of thousands of dollars are traded by verbal agreements. Says one dealer: "If I broke my word in a deal, the word would be shunned."

The hub of the street's activity is the Diamond Dealers Club, which is on the ninth floor of one of the street's newer buildings. The club has 1,750 members, who are among the most respected and established dealers on the street. Election to the club is restricted, coming only after a person has secured a reputation and been fully scrutinized by club members.

Packets of diamonds in the rough, as well as polished stones cut by the street's manufacturers, are traded in the club's nondescript 200-ft. by ft. room. Reports TIME'S John Tompkins: "You get into an elevator with a crowd of Hasidim and feel them staring, wondering who you are. All the brokers know each other by sight, if not by name. A set of electrically operated bullet-proof glass doors leads to the room's lobby, and another automatic door, with the legend NO VISITORS ALLOWED, and operated by a guard, leads to the trading floor. As in every store and office in the area, there are plenty of closed-circuit cameras and hidden alarm switches. The windows are high, and there are dozens of 20-ft.-long tables, lit by fluorescent study lamps, where diamonds are inspected and traded."

A broker with a diamond to sell produces a small paper packet from a leather pouch. The method of folding the paper, white on the outside and pale blue on the inside, has been in use for generation, here and in Europe. For 25 cents, the diamonds are weighed on one of the room's electronic scales, and the result written on the packet. The seller has told the broker what price he wants, and the broker wanders the room soliciting bids. When he gets a good offer, he "seals" the packet, which pledges that he will talk to no more potential buyers until he presents the offer to the seller. If the deal is closed, the broker says "Mazel" (luck in Hebrew) and the buyer replies "Mazel un brucha" (luck and blessing), a ritual used around the world, whatever the ethnic background of the participants.

The trading also involves flocks of individual entrepreneurs, who often make their main living by cutting stones for manufacturers. A typical diamond cutter last week sat in his office, high above 47th Street, and dealt with an elderly broker standing before him. The cutter examined a packet of raw stones with his loupe. He shook his head, wrapped the packet up and handed it back to the broker. The old man wearily placed it in his old leather pouch, held together with tape and rubber bands, and produced another packet. The two haggled for a moment in Yiddish and then the second packet was also rejected. That day there would be no sale between the broker, who carried the diamonds around on consignment, and the cutter. The visitor took his worn pouch, holding stones worth thousands of dollars, and concealed it in an inside pocket of his coat. Then he headed off to another shop.

Casual dealings like these would seem to make the area ripe for robberies. It is hard to say how much is stolen per year — $1.1 million worth of diamonds was reported taken during the first 2½ months of 1979 — because the dealers shy away from police. Says Lieut. Edward O'Connor, commander of the Manhattan robbery squad and a former detective in the diamond district: "It's a very clandestine business. Very few people will cooperate or tell you anything."

Justice is something the community prefers to handle itself. Disputes are arbitrated by a panel of the Diamond Dealers Club composed of three or more men whose logic has been sharpened by intense study of the Talmud, the volumes of Jewish law. The decisions of these scholars, who act like the Jewish religious courts that existed in Europe hundreds of years ago, are law to those in the diamond trade.

One growing problem on the street is that the traditional codes revered by the Hasidim are not as deeply ingrained in what they refer to as the street's "new element." There has been an influx of younger, Middle Eastern Jews into the trade. Says one oldtime cutter: "They are aggressive, irresponsible, not steeped in tradition." Broker Pinchos Jaroslawicz, 25, made the mistake of trusting one of these new diamond workers, a young Israeli named Shlomo Tal. Jaroslawicz took along his pouch of diamonds one day in September 1977, when he went to call on Tal. The young Israeli and an accomplice were found guilty of murdering and robbing the broker and stuffing his body, wrapped in plastic, into a wooden box in Tal's office.

Despite the problems, the street is resisting change, reluctant to move away from dealing in nods and trust and credit. On a sunny spring day, small groups of Hasidim, shaded by their wide-brimmed hats, stand on the sidewalk in front of the delis, speaking Yiddish, holding diamonds up for study and striking deals. Antwerp must have had similar scenes in 1608, when there were 104 Jewish diamond cutters in the city. On 47th Street, the old ways are still the best. They always have been in the diamond business.

ORGANIZATIONAL NEWS

PRESIDENT'S COLUMN

The results of this year's balloting have been tabulated and we are pleased to announce that Bill Neumann was re-elected secretary/treasurer; Mark Baldridge voted our new board member; and the new five person membership committee will consist of Glenda Arentzen, Fred Fenster, Marcia Lewis, Heikki Seppa and Helen Shirk.

The vote on whether SNAG should incorporate was overwhelmingly favorable and Bill Neumann is proceeding with this task. All of the suggested word changes to our by-laws were also passed. It was approved that SNAG should enlarge the number of board members by two, making a total of six. It is planned that these two additional people will be elected at next spring's elections.

An updated copy of our constitution and by-laws, to include these recent changes as well as reflect our non-profit corporation status, will be included in a future issue of the Journal as soon as possible.

Hope you all had a great summer.

Mary Lee Hu
Art Department
Michigan State University
E. Lansing, MI 48824

SNAG CAREER GUIDE

The S. N. A. G. office is endeavoring to formulate a booklet with career opportunity information geared to the secondary educational level. High school counselors have written asking for any information we can furnish them on what their students should know in order to pursue a career in the Goldsmithing field. Things such as: what degrees, if any, are necessary or advisable? What subjects, other than goldsmithing specifically, are advisable? What apprentice opportunities are available, if any? Information on merchandizing jewelry, (in a shop situation; in major craft fairs such as Rhinebeck, and Ann Arbour).

If you are involved with teaching at the secondary level, please tell us what we can do to help your students in their search. If you are a member of an institution which desires having graduating high school students gravitate toward your programs, please write Marcia Lewis telling her about what your programs offer and what you, personally, feel a high school graduate should do to prepare for a future in the field.

If you operate a business, please write saying what you feel a high school graduate should do to make it as you have. What problems can they expect? How can they be dealt with?

Please help us out on this readers. We can't publish information we don't have.

Write: Marcia Lewis, 214 Covina Avenue, Long Beach, Cal. 90803.

SNAG BOOTH
INTERNATIONAL CRAFT SHOW
NEW YORK COLISEUM
JUNE 13 - 17

by Bernie Bernstein

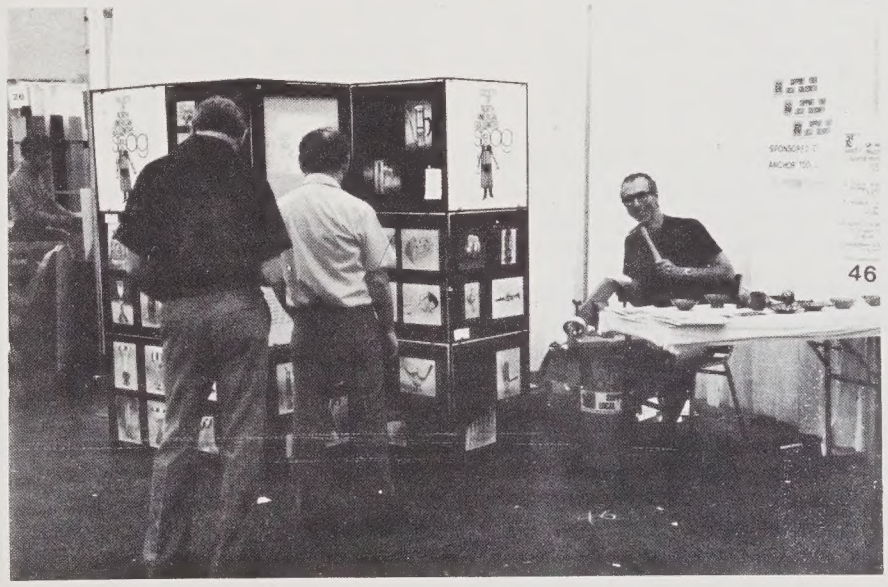
This is a report on Snag's participation in the 7th International Craft Show at the N.Y. Coliseum — an event organized by the New York State Craftsmen and held from June 13 to 17.

Snag's inclusion in the show was made possible through the generous sponsorship of Anchor Tool and Supply Co., Chatham, N. J.; Bill Schroeter, Anchor's owner, was there to cheer us on with the help of his lovely wife.

The show this year represented a noticeable change in format from past years, where the bulk of exhibitors were vendors of craft-related tools, materials and books. The current show was a kind of mini-Rhinebeck and emphasized craft work rather than craft materials. Another feature was a program of continuous live demonstrations (in which I did my raising and planishing shtick).

Reaction to this event was mixed. Attendance appeared down compared to previous years, when it was almost impossible to negotiate the aisles because of crowds. Maybe the available space was greater. I can only speculate on the reason for this lower turnout. The gasoline shortage? Economic problems? Fading interest in crafts? Inadequate publicity? Competition from other events? Father's day? Rhinebeck? Many visitors complained about the absence of tool and material suppliers and the general small size of the show.

Bernie Bernstein "Minding the SNAG Store"



My own impression was that the show was very well organized and spacious. The ingenuity of the display facilities and their attractiveness was top quality and the standard of work shown was excellent.

As for Snag's experience with this show, I was amazed at the interest, enthusiasm and curiosity shown by the visitors. We are no longer an obscure cult hidden in the forest of the craft world. People know about us, show respect for our place in the craft scene and ask lots of questions. We signed up about ten new associate members, sold over a hundred dollars worth of Journals, bumper stickers and catalogues; and handed out numerous membership applications.

The booth itself consisted of a simple Abstracta display structure Glenda Arentzen and I designed a few years ago for one of the early coliseum shows. It has a self-contained, rear-projection, continuous slide show of Snag work. Thanks to Sandy Zilker we had a number of trays of slides, including the Pforzheim show and the survey sets. Display panels consisted of prints of Snag work, past winners of the Sterling Silversmiths Guild competition and descriptive material on Snag and the slides.

This is a good time to thank all the people who lent a hand organizing, setting up and baby-sitting the booth. They include Sandy Zilker, Glenda Arentzen, Laurie Spivak, Tom Markusen, Linda Norden, Ellen Mahoney and Tina Boscarino. Snag members who had their own exhibits at the show included Tom Markusen, Frances Welles, and Carolyn Kriegman.

NEW MEMBERS

We welcome the following new members to SNAG:

PRO MEMBERS:
Marjorie K. Schick, Pittsburg, KS
Anne Graham, Newark, DE
Linda LaRoche,
Francis Stephen, Lubbock, TX
Chunghichoo,
Dan Brookslloyd,
Barbara Minor, Genesco, NY
James Seavey, Gloucester, MA

ASSOCIATE MEMBERS
Artisans DeQuebec, Quebec, Que.
Kathy Downs, Jefferson, ME
Elizabeth REady, Edgartown, MA
Anthony L. Brown, NY, NY
Middle Earth, Ann Arbor, MI
Alexis R. Self, Kentfield, CA
Timothy Grannis, Underhill, VT
Marie Polk, Durham, NH
Craig Castro, San Francisco, CA
Sharon Cordell, Houston, TX
Deborah Katz, Baltimore, MD
Belle Kuhn, Bethesda, MD
Brother Richard Schmidlin, Trappist, KY
Nancy M. White, Honolulu, HI
Bella Zwicker, Tarzana, CA
James Barker, Pasadena, CA
Sidney Bellamy, Nacogdoches, TX
Patricia C. Brown, Chicago, IL
David B. Duncan, San Anselmo, CA
Carol J. Hardev, Shawnee, KS
Jim Hartley, Olympia, WA
Ivanne Custom Jewelry, Corpus Christi, TX
Christopher Slater, W. Bridgewater, MA
Dean Jewelers, Charles City, IA
Jennifer Albright, Seattle, WA
Jessie C. Daniels, McAllen, TX
Linda Fisher, Albany, CA
Susan Joklein, Philadelphia, PA
Greg Storrs, San Diego, CA
The Touch, Inc., Watertown, MA
Jerome Elman, Galveston, TX
Judith L. Schwab, Newport, VA
Ione Foss, Bellingham, WA
Delrdre K. Hammond, Vienna, VA
Lydia T. Hewryk, Winnipeg, Manitoba
John D. LaRue, Dallas, TX
Nancy Monkman, Reseda, CA
Thomas Odell, Chatham, MA
Photo Lab, Philadelphia, PA
Elizabeth Eddy, West Woodstock, VT
Rita J. Montrosse, Princeton, WV
Raedeen I. Perdue, Albany, NY
Lynn Rueschhoff, Lawrence, KS
Rick & Ruth Snyderman, Philadelphia, PA
Jessie R. Barina, Staten Island, NY
Susan S. Chval, Haworth, NJ
Steve Kim, Seoui, Korea
Louise Parrish, NY, NY
Sue Sachs, Parsippany, NJ
Susan Schaus, East Williston, NY
Winifred Wager, NY, NY

STUDENT MEMBERS:
Kim & Don Baide, Bozeman, MT
Robert Blake, Lexington, MA
Kathryn Hendrickson, So. Milwaukee, WI
Renee LaVelle, Clovis, CA
Ruth J. Stourton, Kent, England
Sarah M. Thompson, Newark, OH
Lynn Floriano, Bowling Green, OH
Beverly T. Hood, Austin, TX
Mary McGann, Battle Creek, MI
Marji Nightingale, La Jolla, CA
Sherry Otterway, Cherry Valley, Ontario
Janice A. Smith, Georgetown, Ontario
Mae Burton, Los Angeles, CA
Marna Schwarz, NY, NY
Michelle Venable, Greenbay, VA
Melissa Veres, Lancaster, PA
Marietta Weir, Seattle, WA
Howard L. Werch, San Jose, CA
Amy Anthony, Rochester, NY
Nancy G. Baker, Richmond, VA
Catherine Brown, Houston, TX
John Crawford, Wanaque, NJ
Barbara G. Hendron, Salt Lake City, VT
Susan M. Konieczny, Milwaukee, WI
Trina McCandless, Sungerlands, NY
Laurie Reese, Allentown, PA
Linda Wilfert, Natchitoches, LA
Jack Zagoodry, Brooklyn, NY
Ed Zatursky, Manchester, CT
Elyse Kocis, White Plains, NY
Claude Renaud, Halifax, Nova Scotia
Doug Newcomb, Pocatello, ID
Cary Schwaneke, San Diego, CA
Stanley Largsgaard, Rochester, MI
Melissa McKillen, Rochester, NY
Eric Rothrock, Erie, PA
Naomi H. Thompson, San Francisco, CA
Charlene Sprucebank, Edinboro, PA
Pam V. Timberlake, Greenville, NC
Diana L. Umberger, Muncie, In
Richard Upton, Alameda, CA
Armonita Yuen, Berkeley, CA
Kris McCusker, Bloomington, IN
Patricia B. Jamison, Clinton, NY
Jeri Schatz, Brooklyn Hts., NY

LIBRARY MEMBERS:
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MEMBERS' NEWS

Carrie Adell has exhibited in California Crafts XI and The Craft and Sculpture Show. She will be showing at Pacific States Craft Fair and the Invitation Jewelry Show.

Kim Bass is having a show at Elaine Benson Gallery in L. I., NY. Also, Kim, Amerinda & Ann Marie Montecuello all have places in the jewelry exhibit "Sea Themes" at Aaron Faber's in NYC.

Aletha Biedermann-Wiens won one of this year's GIA Arthur F. Gleim, Jr. Scholarships with the sponsorship of Loeb and Velasco Jewelers, Oakland, CA.

Barton G. Daniels is having a major exhibit of 15-20 pieces of his metal and plastic wearable sculpture at the Arnolfine Gallery in Bristol, England, July & August.

Amy Davison is conducting a workshop in August on Plastics in Jewelry at the Greenwood Gallery in Washington, D. C.

Dennis deJonghe participated in the Northeast Craft Fair at Rhingbeck.

Philip Fike of Wayne State University will be visiting professor of metalsmithing at New Mexico Las Cruces State University during the Fall semester of 1979.

Hannelore Gabriel gave a lecture on making a living as a production craftsman and working efficiency at Ohio Wesleyan University. She received the Horace Potter Memorial Award for excellence in Craftsmanship at the 60th May show of the Cleveland Museum of Art. She is exhibiting at "Women in Art" at Springfield Art Assn. and "Treasures of the Sea" in Ahlen, W. Germany.

Karen Gerstl exhibited her work in the Northeast Craft Fair and the Pacific States Craft Fair. She was chosen to be one of twelve designers to exhibit in the "New Designers Room" in the RJA International Jewelry Trade Show in NYC.

Cecil Herring conducted an electroforming workshop at Daytona Community College in Daytona Beach, Fla.

Carol Kumata had a metalwork show at the class of 1925 Gallery at the University of Wisconsin—Madison.

Norman V. Lanquist had a piece in the show "Arizona Crafts '79," a chalice "Guaje Sagrade" 14" gourd, bamboo, brass and pyrite.

James Malenda had a show "Metal and Enamel Forms" at the Spring Street Enamels Gallery in NYC.

Richard Mawdsley had a show at the Columbia Gallery in Chicago in June.

John C. Mason won an award in the Diamonds Today Competition 1979. His piece was a pin in the solitaire diamond jewelry section.

Ron McNeish and David Benedek gave several silversmithing demonstrations at the Museum of Art Carnegie Institute during the Silver in American Life Exhibit.

Barbara Anne Nilausen was accepted as a George C. Marshall

Memorial funds scholar and spent the summer with the National Museum in Copenhagen studying their collection of gold and silver artifacts, both the Viking and Middle East/Far East Collection. She also worked with goldsmith Ellen Broker for one month studying production techniques.

Natalie Paul had an exhibition of her current work at C & D Designs, Water Tower Place in Chicago. She was also recently featured in Laurie Levy's "Shopwatch Column," Chicago Style magazine of the Sun-Times.

Gene Pijanowski of Purdue University will be visiting professor of metalsmithing at Wayne State University during the Fall Quarter of 1979.

Libby Reisel, Pahaka, Glenda Arentzen, Pat Garrett, Barbara Mail, Don M. Johnson and Margaret Laws are some of the SNAG members who participated in Rhinebeck.

Merry Renk presented a lecture and discussion for Northern California Enamel Guild at their meeting held at California College of Arts & Crafts. Merry spoke about her history as an artist and her jewelry pieces using pique-a-jour enameline and her NEA grant for exploration in pique-a-jour.

John Rotter is having a show "Introduction 79" at the Civic Arts Gallery in Walnut Creek, CA. He will be showing 18 works of his metalsmithing.

Laurie Spivak's "Shell Fantasy" is part of the current exhibit "Art for the Vice-Presidents House" at the Mondale Mansion in Washington, D. C. This exhibit of works from Museum Collections in the Northeast.

Mark Stanitz gave a workshop on "Metal Techniques" at the Haywood Technical Institute in Clyde, N. C.

Thomas J. Terceira was elected Vice President of the Rhode Island Association of Craftsmen for 1979-1980.

Linda Weiss taught a two-day workshop on raising for David La Plantz's students at Humboldt State University. The workshop also included a presentation on health hazards. Linda also has work on exhibit at Artists Gallery, Oakland, CA, in a group show for new faculty at California College of Arts and Crafts. She will be teaching Holloware techniques there during the Fall Semester.

J. Fred Woell conducted a workshop on casting at the Greenwood Gallery in Washington, D. C.

Sandra Zilker had a metals show at the Craft Alliance Gallery in June.

SNAG BUMPER STICKERS AVAILABLE

We have 1,000 bumper stickers, 4" x 14", available stating SUPPORT YOUR LOCAL GOLDSMITH in black letters on a white background. The SNAG logo is printed in black on a metallic gold patch. The price of 50 cents per sticker, or three for $1.00, covers printing and handling. Send a check, payable to SNAG, to Goldsmiths Journal, Longwood College, Farmville, VA 23901. Be sure to include your name, return address and zip code. Include an extra 25 cents for postage whether you order one sticker or ten.

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The Art of Making Jewelry, Takashi Wada, Van Nostrand Reinhold, $11.95.

Basic Metal Finishing, J. A. Von Fraunhofer, Chemical Pub. Co., $20.00.

Centrifugal or Lost Wax Casting for Schools, Tradesmen, Craftsmen, Murray Bovin, Bovin, $8.95 paper, $12.50 cloth.

Chicago Metalsmiths, Sharon S. Darling, U. of Chicago Press, $12.95.

Color Encyclopedia of Gemstones, Joel E. Arem, Van Nostrand Reinhold, $35.00.

The Container Book, Jay & Thelma Newman, Crown Pub. NY, $7.95 paper, $14.95 cloth.

Contemporary Crafts Market Place, compiled by American Crafts Council, R. R. Bowker Co. NY, $15.95.

Contemporary Jewelry, Philip G. Morton, Holt, Rinehart, Winston, $16.95 cloth.

Creative Casting, Sharr Chaote, Crown, $8.95.

Creative Gold and Silversmithing, Sharr Chaote, Crown, $5.95 paper, $9.95 hard.

Creative Jewelry Techniques, Harold O'Connor, Dunconnor, $7.50.

The Creative Lapidary, Frank W. Long, Van Nostrand Reinhold, $14.50.

Decorative and Sculptural Ironwork, Donna Z. Meilach, Crown, $7.95 paper, $14.95 hard.

The Design and Creation of Jewelry, Robert von Neuman, Chilton, $7.95 paper, $13.50 cloth.

The Encyclopedia of Source Illustrations, Morgan & Morgan Pub., $36.00 two-volume softbound, $55.00 two-volume cloth.

Form Emphasis for the Metalsmith, Heikki Seppa, SKU Press, $9.50.

Gold, Johann Willsberger, Doubleday & Co., $24.95 cloth.

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Tradition & Change, The New American Craftsman, Julie Hall, E. P. Dutton, limited quantity $10.98.

PLEASE NOTE:

Contemporary Jewelry: A Critical Assessment 1945–1975, Ralph Turner, Van Nostrand Reinhold, $30, is no longer being published.

Modern Jewelry–An International Survey, Graham Hughes, Crown Pub. has been cancelled with no plans to reprint.

Molding and Casting, Carl Clark, Standard Arts Press, is not available at SNAG discount, but can be ordered directly from Standard Arts Press, Butler, MD 21623, for $15.00, plus 85 cents postage.

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The SNAG European Exhibition catalog is available from the SNAG Book Department, 4885 E. Cheryl Dr., Paradise Valley, AZ 85253. It is 48 pages and contains two full pages on each of the 39 metal artists. Each artist has a photo of the artist, a photo of a piece, a biography and statement. Cost is $10 for non-members and $5.50 for SNAG members. The usual 30% SNAG discount DOES NOT APPLY to this catalog, since it is built into the reduced price. Make check payable to SNAG Book Dept.

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REPORTERS WANTED—If you are attending or hosting an exhibit, conference, lecture, etc., and would like to provide the Journal with relevant information, please write us. We constantly need your assistance in collecting information.

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MOVING?—To insure continued subscription to the Journal, notify the Ohio SNAG Office of any change of address at least six weeks prior to Journal mailing. Remember, the Journal is mailed bulk rate and therefore is NOT FORWARDED. At mailing time, the Longwood SNAG Office simply attaches labels mailed from the Ohio SNAG Office.

NEEDED—People to write small articles and reviews. If you have a special and/or interesting subject or specialty, please write Goldsmiths Journal so that other members can share the benefit of your knowledge, we also need information, sources, helpful hints, etc.

If you know of, or have on your staff, a talented art historian who would like to write metalsmithing/jewelry articles or reviews, please encourage them to do so. Also, please give us their names and addresses and we'll contact them. Thanks!!

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Issue 1 is dated August 1975 and consists of six pages. Subsequent issues are bi-monthly and slowly increase in size until Issue 23, dated April 1979, containing 52 pages. Issues 1-8 cost $1.50 each; issues 9-10 cost $2 each; issues 11-21 cost $3 each. Reprints are only available to members. Overseas orders must include additional postage of $1.50 per issue airmail, or 75 cents per issue surface mail. Send appropriate order and check (made payable to SNAG) to Mark Baldridge, Longwood College, Farmville, VA 23901.

TABLE OF CONTENTS PAGE

Reviews (Exhibitions)
Imogene Geiling Jewelry 2
Ann Grundler 2
Humboldt Metals by J. Chrimoya 3
Arizona Crafts by N. Languist 4
Element Transformation by B. Longhi & R. Wyancko 5
Statements in Metal by L. Stein 6
Paula Dinneen by T. McCreight 7
Baltimore Winter Market by S. Robins 8
Craftsman's Invitational by S. Robins 8
Brookfield 25 by A. Besse-Shepherd 9
Nelsie Davis by S. Long 10
Jewelry by Women by R. Davidson 11
Ward Anodization Workshop by J. Keefer 12
James Malenda by A. Schwed 14
Reviews (Books) by M. Lewis & and K. Kallenberger 13
Information
General 14
Publications 15
Upcoming Events
Conferences, Exhibitions, Workshops 16
Opportunities 18
Exhibition Opportunities 18
Editorials 19
Technical Information 20
Return to the Forge 20A
People
Southern Illinois Graduate Students 34
Bruno Martinazzi 36
Pamela Hassler 38
Feature Articles
Survey of New Products and Techniques by P. Gainsbury 41
Diamonds are Forever 46
Organizational News
President's Column 47
SNAG Booth by B. Bernstein 47
New Members 48
Members' News 48
SNAG Book Club 50